ARCHIVES OF OPHTHALMOLOGY.

FIBRILLARY ŒDEMA OF THE RETINA FOLLOWING CONTUSION.

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(*With a drawing by the author on appended Colored Plate A.*)

In a previous communication [1] the author has described, under the caption of "Sclerosed Nerve Fibres," a striking picture observed after certain intraocular injuries, the appearance being one which could be explained by the hypothesis of a degenerative change in certain optic-nerve fibres, accompanied, or perhaps followed, by a corresponding change in the index of refraction of these structures, and eventually ending in their complete opacification.

The sclerosed nerve fibres were described as "fine hair-like white striations, of equal calibre throughout, running perfectly evenly and parallel in the usual course through the retina of the structural elements derived from the optic nerve. The striations are extremely fine; so much so, in fact, that at times they are seen with some difficulty. They are generally quite long, and can be traced for a considerable distance over the fundus, gradually disappearing, or rather changing into lines which are no longer white, but which look transparent and colorless, like swollen and more highly refracting fibres. The white striæ, while approximately parallel at the point of origin, show a radial course when large numbers are taken into the field of observation and compared. This is quite in accordance with the presumed location of the striæ in the nerve-fibre layer." The

[1] *New York Eye and Ear Infirmary Reports*, Jan., 1904.

surmise was advanced that this sclerosis had probably been preceded by a stage of œdema, in analogy with sclerotic processes in other albuminous tissue, although no such preliminary stage of œdema of the nerve fibres had been actually described or pictured. I have recently had occasion to convince myself that the fibrillary œdema hypothetically postulated is actually a clinical entity, an objective reality, by observing its development in a case of intraocular injury due to blunt violence.

The character of the retinal trauma was somewhat different from that in the cases first reported, and it will be seen that the localization of the nerve-fibre changes was correspondingly altered. The original cases were due to penetration of a foreign body, or to hemorrhage into the substance of the retina; in other words, to direct traumatism, with consequent tissue changes at a given point or over a sharply defined and limited area of the retina. In accordance with this pathogenesis, only those nerve fibres were found sclerosed which had been directly injured. The sclerosis was sharply limited to the nerve fibres implicated in the scar tissue which surrounded the foreign body or developed on the site of the blood-clot.

In the case now reported, the injury, as stated above, was one of blunt violence, resulting in contusion of the globe. There was no hemorrhage, and no direct and hence localized injury of the retina, but a slight concussion or bruise by contre-coup, not violent enough to produce the extensive œdema over the retinal surface described by Berlin as characteristic of retinal shock (commotio retinæ), but sufficiently so to cause a slight serous effusion in the macular region, and a fibrillary œdema of all the nerve fibres radiating from its immediate neighborhood, which suggested the "shot-silk" retina in its optical characteristics.

The clinical history of this case was as follows:

Samuel K., aged twenty, applied for treatment at Dr. Gruening's clinic in the New York Eye and Ear Infirmary on November 2, 1904, stating that he had been struck on the right eye with a sand-bag about thirty-six hours previously. The lids immediately began to swell, and the eye was closed within a few minutes.

The patient applied hot compresses to the eye and smeared the lids with butter. On examination, the left eye is found to be normal. Both lids of the right eye are somewhat swollen; the lower lid shows a linear bruise about 15*mm* long over the lower margin of the orbit. There is marked conjunctival injection, some lachrymation, and photophobia. The cornea is slightly smoky, but uninjured. The pupil is oval, measuring 3½ by 4*mm* as against 3*mm* for the pupil of the left eye.

The amber-brown iris appears a trifle swollen, reacts sluggishly to light and accommodation, and remains unchanged after an instillation of atropine (1 % solution). A number of small radial tears are seen at the pupillary margin of the iris which do not involve the entire thickness of this tunic, so that the uveal layer shows through, and they appear as dark gray nicks. No fundus reflex shines through them. The lower segment of the iris is seen to tremble when the eye is moved suddenly.

Ophthalmoscopic Examination.—The media are clear; the lens is in its normal position. In the inverted image, the macular reflex appears exaggerated, enlarged, and distorted, as if seen through a strong convex cylinder.

After repeated instillations of the mydriatic, the pupil became fully dilated and permitted a careful examination in the upright image. The retina in the neighborhood of the macula is somewhat œdematous, the normal stippling being indistinct. The fovea is intensely but evenly red, with a bright yellow crescentic reflex at its centre. Surrounding it there appears an oval ring, somewhat higher but little wider than the normal macular reflex, of a silvery-white glistening hue, and irregularly wavy or crinkly contour. Slight changes in the angle of the mirror cause this whitish reflex to shift about, the light flashing from one point to another of the ring. Radiating from the oval opacity, a large number of fine milky-white striations are seen, which can be followed for about 2½ papillary diameters. These radii are separated by spaces of normal, transparent retina. They appear to be in the nerve-fibre layer, and beneath the level of the smallest vessels. The latter show, here and there, perivascular whitish reflexes, suggesting the "shot-silk" appearance. This is more marked in the vertical twigs running toward the macula from above and below, which appear frosted and hence somewhat coarser in outline than usual. At one point below and to the temporal side of the macula, there is a small triangular area of

milky œdema. This area had disappeared when the patient was seen again, two days later. On examination with the electric ophthalmoscope, the frosting of the fine vessels above and below the macula appears much more marked, brilliant, and extensive. A plexus of radiating and occasionally intertwining silvery lines runs from the disc, which is somewhat congested, but not blurred in outline, toward the macula. This is surrounded by the above-described halo and sunburst of milky striæ. Change in the angle of incident illumination causes the light to flash along and bring to view other, previously invisible, crisp, silvery-white lines, apparently just below the plane of the large vessels. The whole system of changing, darting, light reflexes suggests the aurora borealis. (Plate A.)

Motility of both eyes is normal. There is no diplopia. V O D, fingers at 6 feet; reads Jäger type, No. 6, at 24–30 inches. Two days later, V O D, fingers at 10 feet, and when last seen, November 6th, V O D, $\frac{20}{200}$; unimproved by glasses. V O S, $\frac{20}{30}$ + to $\frac{20}{20}$ + with sph. − 1. D; Jäger, No. 1, at 3 to 30 inches.

Perimetric examination of the right eye shows a partial, objective, central scotoma for white and colored objects. The latter are correctly distinguished, but appear washed-out and dirty gray. The peripheral boundaries of the visual field are normal for colors and for white.

It is mainly to the clinical and experimental studies of Berlin that we owe our present knowledge of the real nature of conditions which, until comparatively recent times, were thrown together as commotio retinæ, or retinal shock (concussion). The pathology of traumatic retinal œdema (Berlin's opacity), its ætiology and physical signs, are well known. Haab describes the ophthalmoscopic picture in the following words:

"At the site of direct injury a retinal clouding is found; at the point of contre-coup there is generally no second opacity to be found, as the force of the blow spreads evenly over the entire retina, and leaves its traces principally in the most sensitive spot of that membrane, the macula lutea, which now also shows an opacity separated from the other by a zone, however narrow, of normal retina. In place of the red glow of the fundus, we see retinal opacity, which is

at first gray, later more white, and often milky; generally at the site of injury, though very often about the disk and macula; and still another at the point of the retina diametrically opposite the point of injury. In proportion to the violence of the contusion, the opacity may be more or less extensive, and quite gradually diffuses into the normal red coloring of the eye-ground—occasionally with jagged prolongations in the form of white bands. These are frequently seen along the vessels, to which, accordingly, they must bear some relation. The vessels appear darker, and stand out prominently, but are not tortuous or bent as in retinal detachment. The macula appears at the centre of the opaque area as a red spot." The milky opacity is the pathognomonic sign of Berlin's traumatic œdema; it is accompanied by peripheral defects of the visual field (Ostwalt), diminished light-sense (Schmidt-Rimpler), and defective central vision, which is generally reduced to $\frac{1}{4}$ or $\frac{1}{3}$. The opacity originates immediately after the injury, and forms in one or two days, so that it has reached its fullest extent, which may involve the greater part of the fundus, in from twenty-four to thirty-six hours. It disappears in from three to four days, or at most eight days, without leaving a trace. Where visual disturbances persist, we have to deal with some other direct damage to retina and macula.

The ophthalmoscopic picture in this case has several characteristic features, which clearly differentiate it from Berlin's opacity, of which it may be said to constitute a sub-variety or distinct species, being also a mild form of traumatic œdema with similar ætiology.

The condition presents a striking analogy with the pathogenesis and ophthalmoscopic appearance of œdema and sclerosis of the lens fibres. Here, as is well known, after blunt violence we often find an opacity, occasionally transitory, due to œdema from imbibition of aqueous through some small tear in the capsule. In most instances, this stage of imbibition and swelling (œdema) is followed by a loss of fluid, contraction, and sclerosis, with eventual formation of cataract.

This suggests the possibility that the fibrillary œdema

may be due to the soaking up by the nerve fibres of the serum which had transuded into the parenchyma of the retina from the paretic and shocked capillaries and veins of retina or choroid. This hypothesis as to the source of the fluid imbibed by the nerve fibres seems to me the simplest and most natural. It explains the limitation of the œdema and opacification to the fibres radiating from the macula, in accord with the extreme delicacy and liability to shock of the abundant capillaries in this region.

The theory that fluid is forced out of the vitreous into the superficial layers of the retina may possibly account for the marked and extensive "surface œdema" following severe contusion, although the consistency of the normal vitreous and the presence of an intact hyaloid membrane would seem to militate against it. So coarse a mechanism acting over an extended area with such violence as to force apart the elements of the nerve-fibre layer seems incompatible with the very delicate changes of fibrillary œdema, the involvement of but a small number of fibres at the macula, and the absence of any other evidence of retinal injury.

The similarity in appearance to lens fibres in an early stage of "cloudy swelling" is remarkable, not only as to color and shape, but in the peculiar, intangible quality of the appearance, its changing, "capricious" character, if I may so term it, which is of the essence of all light reflexes. I wish to accentuate the fact that this variability and evanescence applies only to the *degree* of the changes. Different parts of the white streaks show up at different times, all at some time, and some all the time. Their presence is invariable, their manifestation is not.

The picture is so striking and novel that further study of these cases is essentially desirable. Unfortunately, the average case of contusion of the globe is diagnosed as a "black-eye"; the patient treats himself, or the "black-eye artist" is called upon. The patients are often unaware of the developing poor sight, because the other eye sees well. They are "cured" and lost to view. Even when the case is seen by a physician, and this includes the oculist, the

fundus is rarely carefully examined. In the very case described above, an experienced observer overlooked the fundus changes. A control by microscopic examination is greatly to be wished; but in the nature of the cases it is very difficult to obtain. The condition does not destroy the eye nor render its removal necessary, so that the acquisition of even a single enucleated globe showing this condition must depend upon its association with some other and more serious injury or disease, or be a matter of chance. The experimental path seems to be the only one left to us; and I believe that the condition could, as easily as Berlin's œdema, be reproduced in rabbits or dogs by laboratory methods. It is my intention to apply them and to report the results, if any, in the near future.

While the changes described above have, in all cases reported, been seen consequent to retinal injury, it stands to reason that such œdema may also accompany or follow a serous exudation into the nerve-fibre layer, due to inflammation. The appearance in neuro-retinitis is, however, quite different. The fact that the œdematous nerve-fibres are plainly visible as separate, discrete, radiating lines indicates that the retinal substance is transparent, and hence practically free from œdema. This could be explained by two hypotheses: first, that the serous transudation had been too slight to produce a surface œdema; or, secondly, that a surface œdema had been present, and that it was being, or had been, absorbed, leaving the fibrillary changes as less transitory, or perhaps as permanent, residua and evidence of the process. It would appear that neuro-fibrillary œdema may persist, and be followed by sclerosis and atrophy as a later stage. Careful examination of the fundus by the direct method, the only way in which the changes can be clearly seen, would, I am sure, show this condition in many cases in which its presence is entirely unsuspected.

TOTAL CONGENITAL DETACHMENT OF THE RETINA IN TWO BROTHERS.

By JUAN SANTOS FERNANDEZ, Havana, Cuba.

THE two following cases may be considered as the only ones on record of the congenital etiological detachment of the retina. I, at least, have been unable to obtain any information upon the subject in the most standard ophthalmic periodicals.

Case 1.—The child X was brought by his parents to my consulting rooms on the 29th of May, 1904. He was then three and a half months old. His parents said that ever since the child was born they were acquainted with the fact that he was blind.

They brought a written diagnosis from a professor who had examined him, which read as follows: "It is my opinion that the child X is afflicted with glioma of the retina in the second period —that is, in intraocular development, accompanied by gliomatous phenomena."

The child presented no other symptom than the opacity which could be seen behind the pupils. The pupils had the normal dimension, and the color of the turbidity was an impure white.

Interested by the diagnosis given by our colleagues, I questioned the parents, to find out the conditions of the eyeballs from the first, and when they assured me that they were expanded from the first, I thought it possibly was a case of amaurotic cat's eye, but when they added that the eyeballs were expanded at birth, I was placed in such a position that I could not entirely refute the diagnosis given by the said professor, and at the same time we found that

there were not enough symptoms to classify the case as glioma of the retina, and therefore I could not proceed to perform enucleation without endangering the child's life.

Time dissipated all doubts, and the diagnosis of congenital detachment of the retina proved to be a fact. There was no consanguinity among the parents; the parents were young and healthy, and among the ancestors of the father only rheumatism and cancer were reported. The child grew and developed in good health, and is at present in a college for the blind, where he is noted for his precocity.

CASE 2.—The child H, one and a half months old, was brought by his parents to my consulting rooms the 6th of November, 1902. The mother said that she noticed that he never fixed his gaze on any particular object; she feared that he would be affected with the same defect as his elder brother. She said that it seemed to her very strange that the pupils were green, and would at times expand and at others contract.

The mother had five children after the first two; the fourth and fifth were girls, all healthy and without defects; but the sixth, although a robust and healthy child, was blind like the first.

In Case 2 there was an opacity behind the pupils that could be mistaken for a cataract, by the color and the situation it occupied. We might think of a tumor in the retina if we were not acquainted with his brother's case.

We could not verify the expansion and contraction of the pupils, and to dissipate all doubts we instilled atropine without any favorable results. The trial with the oblique rays in the dark chamber, using the ophthalmoscopic reflector, enabled us to diagnose a total detachment of the retina in both eyes.

I next tried to find out if this detachment was due to any specific cause, taking into consideration its frequency in syphilis and the effect of the latter on the embryo. Some one assured me that there were remains of such in the father. I tried to submit him to an examination, but he always evaded the trial. Perhaps he thought that he had nothing of the kind, which could have been an error on his

part, and which deprived us of the opportunity to clear up an important point of etiology.

The frequent localization of syphilis in the background of the eye, especially in the retina, made me think of the possibility that the affection of these two brothers was heredito-specific.

In their publications the following authors, Locktewr,[1] Cruchandeau,[2] Sidler Huguenin,[3] Hirschberg and Antonelli,[4] are inclined to assume a specific etiology for cases of congenital detachment of the retina to which we refer.

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[1] "Sur l'anatomie pathologique des yeux des enfants nouveau-nés atteintes de syphilis congénitale." *Thèse de Saint Petersbourg*, 1899; *Revue générale d'opht.*, 1899, p. 534.

[2] *Ueber die heredito-syphilitischen Augenhintergrundveränderungen nebst einigen allgemeinen Bemerkungen über Augenerkrankungen bei angeborner Lues* (Hamburg u. Leipzig, 1902, Leop. Voss.).

[3] *Von Graefe's Arch.*, vol. liii., 2, pp. 360–370.

[4] XIII. Congrès International de Médecine de Paris in 1900, session of Aug. 8th.

RECURRENT PARALYSIS OF OCULAR MUSCLES ASSOCIATED WITH PAIN.[1]

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THE following is a good example of a case, of which only some forty have up till now been reported.

When I first saw the patient, in February, 1902, he was twenty-eight years old. He then told me that ten years previously he had had a slight attack, lasting for only a few days, but it was not till seven years later that he experienced the full force of his trouble, which has consisted in recurrences of excruciating pain in the left eye and temple, followed by paralysis of the third nerve. I shall first describe his condition as I found it at his first visit. He had been partaking freely of acetanilid, codeine, and morphine for the relief of his suffering, and in consequence was pale and slightly cyanosed, with a very weak pulse. The attack had begun the night before with pain, which had come to a height in an hour or two. The diameter of his right pupil was now *2mm*, that of his left 6.5*mm*. Vision of both right and left eyes was full, $\frac{6}{6}$ without H. m. Left accommodation was paralyzed, and he required a plus 3 D lens to read at twelve inches. The movements of the globe were still normal, and there was no ptosis. Left T was normal, and the interior of the eye was healthy. I prescribed croton, chloral hydrate, and gelsemium, to be begun when the effects of the other drugs had diminished, and two leeches. I saw him again on the third day, and found that the prescription had been of no benefit, and that soon after his visit to me the external muscles had begun to be affected. He had now absolute ptosis, and, though the eye did not then diverge, he

[1] Read before the Georgia State Medical Association, April 21, 1905.

could turn it outward, but in no other direction beyond the middle line. No movement of the sup. oblique was observed. The pupil was fully dilated. The pain had somewhat lessened. I advised arsenic, quinine, and strychnine. When I next saw the patient, six months later, the left pupil was still too large, but acted fairly well to light and to convergence. There was no ptosis, and the ocular movements were normal. He had occasional pain, and he now tells me that on waking his vision was poor for near objects, and that then he used and still uses eserine, each application enabling him to read for two or three hours, and making the pupil as small as the other, or smaller. Without eserine he had required a plus 3 D lens. There was a slight but apparent exophthalmos. I saw him a month afterwards, in September, when an acute attack of pain was just beginning, and prescribed dionin, with, as I expected, no benefit. Between then and now he has had attacks of pain every two to four weeks, with slight paresis once, in December.

Looking back over the history of the affection, as it has been in his case, we find in many points a close similarity to the majority of the others which have been published. On neither the father's nor the mother's side was there any nervous affection, and among seven brothers and four sisters in only one case—the sister just older than himself, who has migraine every fortnight. It is not usual to find the family history so free from nervous cases. His own general health seemed to be good: no malaria, no rheumatism, no specific history or symptoms, no albuminuria, no diabetes; knee-jerks, nose, throat, and ears normal. His only trouble is a distinct tendency to constipation and dyspepsia. Four years ago his neck was hurt by an elevator, without apparent subsequent bad results.

In considering the frequency of the attacks, it is necessary to separate the pain from the paralysis. Seven years divide the first from the second attack of pain, which occurred four and a half years ago, since which the intervals between the attacks of pain, lasting each four or five days, have varied from fourteen to thirty days, but he has had altogether only four onsets of paralysis. The first was in 1889, from which he recovered in two months, the second a year later, from which he took three months to get well. The next, the

following year, continued for six months, and from the last attack, a year afterwards, in February, 1902, he recovered in three months. Besides these there was also a slight paresis in December. But in speaking of recovery, it is necessary to modify its meaning, because the pupil has never become normal in size or action since the first attack, and since the second the ciliary muscle has been more or less paralyzed, so that he cannot read with the affected eye without eserine or a plus 3 D lens, the distant vision being normal. This continued ciliary paresis is the only instance of the kind, which I have seen recorded, but there is a general tendency towards chronic paresis of the iris after a number of attacks. The aching, which is very painful, sharp, and continuous, lasts twenty-four to thirty-six hours before any paresis appears. This patient thinks paresis would always have appeared had it not been for large doses of acetanilid, the only drug, he says, which is of any use. He, unlike many cases, does not vomit, unless sometimes on purpose, in order to relieve the pain.

The sensation of the face has not been diminished, but a soreness remains long after the acute pain has disappeared, and indeed now seems to be permanent. There is nothing remarkable during or after the attacks in relation to the amount of urine passed, the patient's manner, the movements of the facial or lingual muscles, the secretion of tears or of saliva—all of which have been abnormal in some other cases recorded. As regards sex, the case is one of the minority.

The F V was not taken during the height of an attack, but in an interval taken by the hand it was full. No scotoma was shown for red or green. At no time was there pain on pressing the globe back into the orbit.

Recurrent paralysis of an ocular motor nerve associated with pain is well exemplified in this case. The third is the nerve most commonly affected, and sometimes only the branches to the external muscles, but the others, and even the seventh, are not immune, and sometimes all are attacked at the same time. The tendency generally is towards a diminished degree of recovery between attacks.

Concerning the etiology of the affection, though Charcot called it ophthalmic migraine, though it is frequently found in neurotic families, and though a large proportion of those who ultimately suffer from it, and many who never do, have a history of periodic headaches on the same side, yet the fact that the pain is so prolonged (it is said that the pain of migraine never lasts less than six nor more than twenty-four hours) the absence of visual phenomena, and the restriction of the site of the pain make it probable that the disorder is not true migraine. Besides, the permanent paresis in the iris and in the ciliary muscle seems sufficient to put the theory of any functional disorder out of court.

If it is not functional, where is the lesion? Not in the cortex, because if there the paralysis would have been conjugate. Drs. Holmes-Spicer and Ormerod, in their description of a case, in which "voluntary closure of the lids is complete, but in ordinary unconscious blinking the left (paralyzed) lids sometimes do not close at all," give this as an exemplification of those cases confirmatory of Mendel's hypothesis. Mendel's hypothesis, which has proven to be almost certainly correct, is that the orbicularis muscle is supplied by the nucleus of the third nerve, though the fibres run in the seventh nerve. But the fibres from the third nerve to the seventh enter the latter above its nucleus, because lesions of the seventh at the level of the nucleus or below paralyze the orbicularis. It follows that if one and the same lesion in their case paralyzed the third nerve and the orbicularis, it must have been a cortical lesion, and yet the paresis was not conjugate, but one-sided.

It is probably not nuclear, because acute nuclear paralysis of the third nerve is usually a symptom of serious progressive disease, is generally binocular, is apt to affect the levator palpebræ little or not at all, and is not likely to be associated with pain in the third nerve.

It is probably not fascicular, because one would expect, along with the ocular paralysis, crossed hemiplegia. There remain only the nerves between their appearance on the cerebral base and the eye. If the lesion lay within the orbit, we should probably have other local symptoms, such

as tenderness there, at least on pressure or movement, and there was none. Besides, there would be a likelihood of involvement of the optic nerve, and in only one of the cases which I have seen so far published was there any such thing. That was a case of partial optic atrophy, which may have been an entirely separate matter. In a recorded case also of double ophthalmoplegia externa, with limitation of F V, the optic nerve may have been affected. But in the case now under consideration at least the paralysis is almost certainly of basal origin, and as only the superior branch of the fifth nerve is involved, the pain being confined to the distribution of that division, the lesion must lie between the Gasserian ganglion and the sphenoidal fissure. It may here be observed that in basal lesions of the fifth nerve the third nerve is generally paralyzed.

It may have been noticed that I have stated that, at a time when the third nerve in this case was already apparently paralyzed, the eye was still movable to and from the middle line outwards. Indeed the patient believes it never was fixed in divergence, and could always be moved somewhat outwards, though we may assume that the completeness of the ptosis interfered with his observation on this point, especially as we know that the sixth nerve of one side communicates in the brain with the third of the opposite side. A certain series of sixth-nerve cases should be interesting in this connection. Of these, I have myself seen some half dozen. In them the external rectus alone is paralyzed, or absent, and yet the eye at rest does not turn inwards, but lies when at rest in the middle line. I do not advance any theory to account for the absence of deviation in these cases. But some of Sherrington's investigations are interesting in connection with them. He showed that "the cortical area for the contraction of a given group of muscles coincides with the area for the inhibition of the group antagonistic to it." He divided the nerves to all the muscles of the left eyeball of a monkey, except the external rectus, producing a condition resembling that of my patient. Stimulation of those cortical centres which cause a conjugate deviation of both eyes to the right resulted in a

movement of the left eye toward the middle line. This is held to be due to a simultaneous inhibition of the opposing muscles, in this case the left external rectus. Other experiments show that "the cells, the activity of which is thus inhibited, must lie below the cerebral cortex."

In the case of this patient, he himself believed the foundation of his troubles lay in his digestive apparatus, and a toxæmia appears to the writer to be the most likely explanation. But why the paresis should be in part permanent is a question. It might, however, perhaps be answered by supposing a resulting destruction of nerve tissue, such as we frequently see in the optic nerve after an acute inflammation. Dr. Bates Block informs me that the patient came under his care on account of dyspepsia, and that he believes that the treatment directed towards the improvement of the condition of his abdominal organs has been of use in reducing the severity of the attacks of pain. Priestly Smith also mentions a case for which he prescribed with decided benefit regulation of diet and a pint of hot water night and morning.

In one case (recorded by Kljatschin), malaria appeared to be distinctly the cause, and large doses of quinine had a curative effect.

So far as I am aware, only four of the recorded cases have arrived at the post-mortem table. In one was found a fibrochondroma of the third nerve. In the second were plastic exudations and fibrous adhesions, involving the coat of the third nerve. In the next were granulations containing tubercle bacilli around the third-nerve root, and in the fourth a small fibroma connected with the dura mater completely involved the third nerve.

This other case may be worth reporting, in a few words, though doubtfully belonging to the class under discussion. Betty J., a colored woman, forty-one years of age, nursing a baby seventeen months old, in July observed *swelling of the left lids*. Some days later severe pain began in and around the left eye and in the temple. A week or two later she consulted me concerning the pain, and also on account of diplopia, which was just beginning. I found then that all the branches of the third nerve acted

normally. Four or five days later the left external rectus was paralyzed, with marked strabismus. Five days later, the inferior rectus also showed slight though distinct paresis. The third nerve otherwise remained unaffected. The fundus, vision, knee-jerks, and facial sensation were normal. There had been no vomiting and no constipation. Nothing was found in the orbits. No scotoma for colors. F V full. There was no polyuria.

There was no history of trauma or syphilis, but out of her twelve children four were born dead. I prescribed anti-specific drugs. The pain gradually diminished, and in thirty days from the beginning there was none, and the movements of the eye were normal.

Several cases of recurrent paresis of the sixth nerve are included in those gathered together by Drs. Holmes-Spicer and Ormerod,[1] and Drs. Wissering, Anderson, and Ormerod have each recorded cases of one-sided ocular paralysis associated with œdema of the lids and pain.

NOTE.—This paper was written nearly two years ago but not published, because I desired to make further observations during an acute attack, which, however, has not occurred. I saw the patient the other day (on June 9, 1905) and his eye was still as described above.

[1] *Trans. Ophth. Soc. of Great Britain*, vol. xvi., p. 279.

GLAUCOMATOUS CLOUDINESS OF THE CORNEA.

By Dr. P. SILEX, Berlin.

Translated from Volume XLII., German Edition, October, 1900, by Dr. Matthias Lanckton Foster.

IN acute glaucoma the cornea is smoky, dull, and stippled, a condition universally ascribed to the presence of œdema between the epithelial cells. The general acceptance of this theory is probably due to the very careful pathologico-anatomical studies of Leber,[1] Fuchs,[2] Birnbacher and Czermak,[3] and the opinion of Arlt.[4] Fuchs demonstrated an œdema of the anterior lamellæ of the cornea in a comparatively fresh case of glaucoma. He found gaping spaces which were either empty or filled with fluid. The little nerve canals were distended with œdematous fluid. The superficial epithelium was smooth, with very minute drops in the deepest layer between the basilar cells and in greater number between the cells of the middle layer. In some cases a structureless layer was present between the epithelium and Bowman's membrane, which he took to be a homogeneous substance that had formed during life from a thin layer of fluid. The aqueous was very albuminous and filtrated forward through the cornea. There were also round cells, which by their accumulation pushed forward the epithelium, vessels, and a fibrous tissue with few cells. The theory of filtration from the anterior chamber is consonant with the investigations of Leber. The endothelium, in which he could find no change, certainly forms a hindrance but is not absolutely impassable.

According to this view, the cloudiness is the result of the interposition of layers of fluid of varying thickness and of little refractive power between the more refractive lamellæ of the cornea. The œdema is held to explain the rapid coming and going of the cloudiness and the dull, lustreless appearance of the cornea, while the stippling is explained by the slight elevations produced by minute collections of fluid. There is no doubt as to the correctness of the description of the conditions found; they have been confirmed by many investigators, but these conditions are not always present even after the disease has lasted a long time. For example, Birnbacher and Czermak wrote of their third case that the corneal tissue was very firmly united and showed no œdematous spaces.

When a freshly enucleated eye is squeezed between the fingers, the cornea becomes hazy. What anatomical change takes place is unknown. My own studies in regard to this have yielded no results, because it is impossible to harden the globe under pressure on account of diffusion. In 1880, Fleischl * became interested in this question and ascertained that the tension of the cornea produced by increased intraocular pressure caused radiating, doubly refracting elements to appear throughout the cornea, while pressure applied to a certain point caused those radiating elements to appear only in the immediate neighborhood of that point. The media of different refracting power thus placed in manifold layers upon each other produced many reflexes of light within the tissue, and so caused loss of transparency.

Fuchs was aware of these investigations of Fleischl, but came to the conclusion, and with him the whole ophthalmological world, that the cloudiness of the cornea present in glaucoma was not the same as that produced by pressure, because the artificially produced cloudiness disappears more quickly than does that of glaucoma, will disappear of itself under long-continued pressure, which is not the case in glaucoma, and is not accompanied by the loss of lustre and the stippled appearance of the surface of the cornea which are present in the disease. Although these distinctions are correct when the artificial cloudiness is produced by

pressure on the corneo-scleral margin, they will not stand the test when the pressure is produced by the injection of fluid into the vitreous. If physiological salt solution is injected into the vitreous of the luxated eye of an anæsthetized rabbit, a very delicate cloudiness of the cornea appears at a certain pressure, at a higher pressure it becomes dull, lustreless, and looks like a glass which has been breathed upon, and at a still higher pressure it becomes of a smoky, dirty gray. This condition was diagnosticated by several of my colleagues, who were not apprised of the experiment, as glaucomatous cloudiness of the cornea. After a while the cloudiness diminishes. This is to be explained by the lowering of the pressure by removal of the fluid through the circulation and by leakage around the needle, and it can be brought back immediately by pushing forward the piston of the syringe. By moving the piston of the syringe forward and backward, the various stages of a glaucomatous cloudiness of the cornea may be reproduced, and then a clear cornea again, all frequently within the space of a minute, a fact which is of value for the purpose of demonstration.

Only a few points need be mentioned to prove that this experimental cloudiness cannot be caused by œdema. Knies has proved that absorbable fluid can penetrate quickly from the anterior chamber into all the layers of the cornea, and Weiss has observed the same after the injection of potassium ferrocyanide into the vitreous, but it does not pass back and forth as quickly as the cloudiness in this experiment. An œdema could not come and go so quickly in the loosest subcutaneous human tissue, and in the cornea it is utterly impossible. For Leber[7] has taught us that the change of fluid is very slight in the dioptric apparatus, and that the fluid held in the cornea, to be expressed only under great pressure, is in its substance, not in special spaces and canals. Such do not and cannot exist on account of the great power of imbibition of the walls. Œdema cannot be forced to penetrate the cornea in so short a time by the pressure of the injection. According to Mellinger,[8] it takes a minute for a cornea affected by cocaine to be stained green by a solution of urinine.

Nothing else remains to explain the glaucomatous cloudiness except the change of form of the cornea. Helmholtz[9] has shown that under pressure such a change occurs, and that the greater the pressure the greater is the radius of curvature of the vertex of the cornea. A membranous envelope containing fluid must the more nearly approach the form of a sphere the higher the pressure of the fluid becomes, because with a given superficies a sphere contains a larger volume than any other form of body. In the case of the eye, the sulcus between the cornea and the sclera must be pressed out and thereby the cornea be made less curved. This has been corroborated by later investigations. Schelske and Eisen[10] demonstrated that hypertonus lengthened the radius of curvature of the middle of the cornea. The peripheral and basal portions undergo proportionately less change of curvature because the middle portion is thinner and less resistant. Laqueur[11] found a noticeable flattening and an increase in all diameters after an injection into the vitreous. Clinically a change of curvature of the cornea could not be proven in the case of a woman who had glaucoma which had increased her hypermetropia, or in two other patients. Donders, Coccius, and Mauthner found no markedly large radii. But the frequency of astigmatism against the rule is opposed to these few observations and shows that a change of form takes place.

In my opinion the glaucomatous cloudiness of the cornea depends in acute cases upon the stretching thus caused.

This idea was suggested to me several years ago by clinical observation, and any one may convince himself of its correctness by watching an iridectomy for acute glaucoma uncomplicated by serous iritis or erosion of the cornea from cocaine and sublimate solution. Before the knife has completed the incision, as soon as the tension has been reduced by escape of the aqueous, the dull gray cornea becomes absolutely clear, except when the disease has lasted a long time or the above-mentioned complications are present. I have often demonstrated to a large circle of spectators the instantaneous disappearance of the cloudiness due to the disease. It is to be seen best when a fresh glaucoma is

operated on under general anæsthesia, and observation of such a case will convince any one of the correctness of what has been said and of the impossibility that an œdema could pass away so quickly.

The results of anatomical investigation of cases of true acute glaucoma, not those of old cases, tend to confirm this theory. The eye examined by Elschnig[12] had had glaucoma twenty-three days, but even then the epithelium showed only degenerative changes, and the parenchyma of the cornea was free from clearly pathological changes. In the second eye also, which was enucleated at the end of seven days, the epithelium showed nothing but degeneration.

Zirm[13] thus describes an eyeball which was enucleated five days after the outbreak of the second attack of glaucoma, the cornea of which presented a slight diffuse cloudiness and a distinctly stippled surface. "The epithelium is intact, Bowman's membrane unchanged, parenchyma without increase of cells, interlamellar spaces not enlarged. In the outermost marginal zone of the parenchyma are delicate vessels extending from the sclera into the different layers."

It seems plausible to me that the anæsthesia of the centre of the cornea should be due to the interference with the function of the nerves by the stretching of the tissue, as well as that after the disease has persisted a long time, accumulations of fluid and trophic disturbances should take place in accordance with the observations of Leber, Fuchs, and others. These produce only a very slight haziness. The true dull gray cloudiness suddenly disappears in these cases also, and is therefore due for the most part to the stretching.

To summarize, I believe that in acute glaucoma the cloudiness of the cornea does not depend on an œdema, as has hitherto been supposed to be the case, but upon a stretching of the cornea whereby doubly refracting elements are induced to appear which cause a multiple reflection of light. This theory is based on experiment, clinical observation, and pathological anatomy. A cloudiness of the cornea is produced by injection of fluid into the vitreous which is similar in appearance to that of acute glaucoma.

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PAPILLO-RETINITIS FROM IODOFORM POISONING.

By Dr. MICHAEL MOHR, Budapest.

Abridged Translation from Vol. XLV., German Edition, July, 1902, by Dr. Matthias Lanckton Foster.

SINCE iodoform began to be used in surgery many cases of poisoning have been reported. Sometimes only the tissue is affected to which the application is made, sometimes, in addition to this, other tissue at some distance is involved, sometimes there is systemic poisoning evidenced by various affections of the skin, the subcutaneous tissue, the internal organs, the central nervous system, or the eyes. Diplopia, amblyopia, with central scotoma, retrobulbar neuritis, and partial optic atrophy have been ascribed to iodoform poisoning, and the report of the following cases may not be an unwelcome addition to the literature on the subject. The reasons why cases of iodoform poisoning occur are only partially known. Probably impurities in the drug, the size and character of the wounded surface, the pressure applied to the dressings, and individual idiosyncrasy have each some influence on its production.

Case 1.—S. S., thirteen years old, admitted to hospital Nov. 13, 1900, for coxitis and a cold abscess. Treatment by injection of the abscesses with a ten-per-cent. emulsion of iodoform was begun on the 15th. Between this date and Jan. 24, 1901, 230*gs* of the emulsion, or 23*gs* of pure iodoform, had been injected, but it should be noted that at each puncture a great part of what remained from the previous injection escaped.

Jan. 30th.—Patient complained of hazy vision.

Feb. 3d.—Could count fingers at a distance of only half a metre.

Feb. 5th.—The abscess was emptied of about 20*gs* of pus which smelled of iodoform, and the cavity was cleansed.

Both pupils moderately dilated, reacting promptly to light. Media clear. Papillæ moderately swollen, margins indistinct, veins enlarged and tortuous. Outward rotation of the right eye restricted, other movements of the eyes free. There was strabismus, loss of appetite, and inability to sleep. During this day and the next speech was difficult, stammering, and incorrect. He was conscious that he spoke wrongly and would catch himself. Passed urine involuntarily and did not sleep. Pulse 120, full. Temperature from 36.4° to 37.5° C. Knee reflex absent. Brain fairly clear during the day. That night he became very restless, and finally raving, so he had to be moved from the ward. Was finally quieted with chloral. Passed fæces and urine involuntarily.

Feb. 15th.—Strabismus gone.

Feb. 25th.—Vision better.

March 3d.—Patient quiet, sleeps well, vision improved. No swelling of the disks, but the outer half of the right is still a little pale. Eyes fail to converge. Counts fingers, but not with certainty. Iodoform constantly present in the urine.

March 22d.—The pus was again removed from the abscess cavity and found to contain and to smell of iodoform, although none had been injected for fifty-nine days, and the cavity had been washed out on Feb. 4th.

April 26th.—Right papilla pale, arteries and veins small. Outer part of left papilla pale, vessels of normal size. Eyes move freely in all directions. R V $\frac{5}{10}$; L V $\frac{5}{7}$. Fields contracted, especially above.

Case 2.—H. H., twelve years old, admitted Sept. 18, 1900, for coxitis and cold abscess. Treated with injections of a ten-per-cent. emulsion of iodoform at intervals up to April 18, 1901.

April 25th.—Faintness, loss of appetite, hazy vision.

April 26th.—Between 300 and 400*gs* of pus were removed from the abscess cavity, which was washed out with sterile salt solution.

Both pupils moderately dilated, reacting promptly to light. Media clear. Both papillæ swollen, the left more than the right, margins indistinct, a grayish-white exudate here and there on the

arteries, the veins tortuous and dilated. Near the upper temporal vein was a hemorrhage half the size of the papilla. Vision in each eye $\frac{1}{60}$.

April 27th.—Patient quiet. Appetite better.

May 2d.—Fields somewhat contracted.

May 4th.—Counts fingers with the right eye at one metre, with the left at five. The retinal hemorrhage has disappeared.

May 10th.—Swelling of papillæ less, margins indistinct, less exudate on the arteries. Counts fingers at five metres.

May 20th.—Margins of papillæ distinct. No exudate on the arteries in the left eye. R V $\frac{5}{15}$ (?); L V $\frac{5}{15}$ (?).

May 25th.—Temperature 38.9° C. The old as well as recently formed abscesses were punctured and 10*c cm* of the emulsion of iodoform injected.

June 27th—Fundus normal. R V $\frac{5}{5}$; L V $\frac{5}{10}$.

In both of these cases all other causes of the papillitis were excluded, such as tumor of the brain, tuberculous meningitis, acute infectious disease, anæmia, heredity, orbital disease, abscess of the brain, thrombosis, apoplexy, a cyst, or a chronic meningitis, so that the papillitis, or papilloretinitis, must have been caused by the iodoform poisoning.

THE INFLUENCE OF CAFFEINE ON THE FIELD OF VISION IN QUININE AMBLYOPIA.

By Dr. GUSTAVE SCHWABE, Leipsic.

Translated by Dr. Matthias Lanckton Foster from Vol. XLII., October, 1900, German Edition.

THERE is no case on record in which 1.25*g* of muriate of quinine has produced amaurosis, with pallor of the papillæ, permanent diminution in the size of the retinal arteries, marked concentric contraction of the field of vision, and hemeralopia, in an adult with defective nutrition, but otherwise healthy. Yet the special interest of the following case lies in the hitherto unknown influence which may be exercised by caffeine on the field of vision. In from fifteen to sixty minutes after drinking a fairly strong cup of tea or coffee the field of vision, already much contracted as the result of the quinine intoxication, would undergo a further contraction, almost to the point of fixation, and then would return to its previous limits in about the same length of time. No permanent injury to the vision had resulted from the use of coffee at the end of a year.

The patient was a highly intellectual woman thirty-three years old, who had neither at that time nor previously hysteria or any serious general disease. She was 150*cm* tall and weighed 60 kilos. Her nutrition was imperfect. For ten years she had been accustomed to eat a hearty meal only at midday, in the evening had taken nothing but a cup of coffee, tea, or soup, with nothing solid, in order to sleep well, and for a week previous to the quinine poisoning had been confined to her room and had taken liquid food exclusively because of a toothache. Her skin was

pale and delicate, with a sufficient amount of subcutaneous fat, the heart's action regular but feeble, the radial arteries small and soft, the pulse scarcely to be felt. During the course of the year she presented the picture of a relatively well nourished but muscularly weak person, enfeebled by too much liquid diet and too sedentary a life.

Sept. 24, 1897, at 5 P.M., the patient took, under the advice of a physician, five powders of 0.25*g* each of quinine for the relief of her toothache. She passed a restless night, with severe pain in her stomach and vomiting. At 8 P.M., while half asleep, she noticed the light, but at 10 P.M. the room seemed perfectly dark, though lighted by a lamp. At 6 o'clock on the following morning she awaked frightened by a loud ringing and discovered that she was blind. Her other symptoms, vertigo, dizziness, tinnitus aurium, pains in the stomach, and nausea, were not important. At 9.30 A.M. I found normal heart action, weak pulse, brain clear, and the general condition little affected aside from the blindness and the tinnitus aurium. The eyes were externally white, unirritated, and freely movable. The corneæ were normally sensitive. The pupils were dilated, fixed, and did not respond to light. There was a central opacity of the left cornea caused by an injury in 1895, in consequence of which most of my observations had to be confined to the right eye. The refractive media were clear, the papillæ pale; the arteries greatly, the veins slightly, reduced in size. There were no other changes to be seen in the fundus. There was 1 D of myopia and complete amaurosis. The tension was normal.

At noon, nineteen hours after taking the quinine, perception of light began to return in each eye simultaneously, first on the nasal side, then from below. There was as yet no pupillary reaction, the retinal vessels were very small, and there appeared to be a slight haziness of the papilla and retina. Treatment consisted of strengthening nourishment and warm baths. That night the patient slept fairly well and perspired profusely. By noon of the 26th all symptoms of the intoxication had passed away except the interference with vision. The pupils had become somewhat smaller and reacted slowly to light. With correction of the myopia the vision of the right eye was $\frac{1}{12}$, of the left $\frac{1}{12}$. Print 8*mm* in height could be read with difficulty. Peripheral vision was still abolished, as well as the ability to distinguish colors. The condition of the fundus was the same as on the

previous day. At 6 P.M. the central vision of the right eye was $\frac{6}{15}$, of the left $\frac{1}{24}$. Colors could be recognized with uncertainty. Ophthalmoscopic appearance unchanged.

Sept. 28th, 8 A.M., R V $\frac{6}{15}$, L V $\frac{1}{24}$. Schweigger 0.3 could be read with difficulty at 16*cm.* Central vision for color good. The field of vision had enlarged to:

	White.	Red.	Green.
Temp.....	25°	7°	3°
Nasal.....	22°	7°	3°
Up.....	17°	7°	3°
Down.....	20°	7°	3°

Sept. 29th, Pupillary reaction still slight. The papillæ were still pale, their margins slightly indistinct, and the retinal vessels remained small, but the haziness of the papilla and retina had almost disappeared. The field for white had increased externally to 28°, internally to 25°, upward to 26°, and downward to 22°.

Oct. 5th.—Pupillary reaction still slow. R V $\frac{6}{7.5}$, L V $\frac{1}{24}$.

Dec. 13th.—The pathological process appeared to have come to a complete standstill. Both pupils were of normal size and reaction. Papillæ a little pale, but with clearly defined margins and no trace of haziness. Retina without haziness, but with vessels small and threadlike. R V 1, L V $\frac{1}{24}$. The fields were:

	White.	Blue.	Red.	Green.
Temp	35°	21°	28°	15°
Nasal.....	35°	22°	24°	18°
Up.....	28°	19°	20°	16°
Down	30°	18°	20°	17°

During the following year the patient was constantly under my observation. On June 6, 1900, I could find nothing abnormal in the fundus aside from the very small arteries and rather small veins. R V 1, L V $\frac{1}{24}$. The fields as taken in very bright daylight were:

	White.	Blue.	Red.	Green.
Temp.....	34°	26°	28°	30°
Nasal.....	25°	24°	24°	30°
Up.....	25°	23°	26°	28°
Down.....	24°	20°	17°	20°

This narrowing of the field of vision and the hemeralopia, which had existed ever since the poisoning with quinine, formed the basis of most of the complaints of the patient, who on account of the death of her husband was obliged to teach almost daily from ten to twelve hours, and this she was obliged to do almost exclusively in her house because she could not go on the street in cloudy or rainy weather, particularly in the evening. At such times her vision sank to perhaps a fourth, and this was the more troublesome because of the corneal opacity in the left eye. A bright street lamp then appeared to her as a light point with its surroundings enveloped in mist, and because of her imperfect vision downward she was apt to stumble over the children. Her ability to distinguish colors was also less in the evening. Even in broad daylight the function of the retina seemed dependent on the blood pressure and the comfort of the patient. Thus there was an improvement of vision after prolonged, not too violent exercise in the open air, after meals, and after intervals of mental rest, while there was a deterioration of both central and peripheral vision after remaining long indoors, when hungry, after physical or mental over-exertion, and particularly during her menstrual periods.

But the greatest concentric contraction of the visual field and the highest degree of constriction of the retinal arteries were observed regularly in this patient from the commencement of the quinine amblyopia after drinking a cup of strong coffee or tea. As we have as yet very little knowledge in regard to caffeine amblyopia, I will give the results of my observations in detail.

To maintain her mental activity, the patient would drink one or two cups of strong coffee during the afternoon three or four times a week, with the result that in about an hour her field would be contracted to the fixation point. Occasionally she would take a hot cup of strong tea in the evening to relieve her weariness, which would cause a contraction of the field lasting at the most fifteen minutes. The support afforded her by the coffee was felt immediately after it had been drunk and lasted two hours longer than the disturbance of the visual field. Prior to the quinine intoxication neither coffee nor tea had ever had any bad influence on the vision, and the activity of the heart was in no way affected either at the present time or formerly.

I investigated also the influence of coffee and tea on the visual field of this patient when taken in the morning, when she was

mentally and physically vigorous, as she was accustomed to take it in the latter part of the day when weary, but the results were the same.

June 12, 1900.—Patient rose at 5 A.M., ate some stewed gooseberries, taught for two hours, and felt thoroughly well. Physical examination revealed nothing abnormal. The cardiac sounds were clear but very weak, the radial pulse was 60 per minute, scarcely perceptible. At 10.30 A.M. she drank within a minute a cup of hot coffee prepared in my clinic, 15*gs* of finely ground Guatemala coffee to 250*gs* of water. The amount of caffeine may be estimated at from 0.1 to 0.12*gs*. At 10.35 the peripheral portion of the field began to appear veiled, while the central vision and color perception remained normal. The following perimetric records were made at intervals of a few minutes. The sky was cloudless:

		White	Red	Green	
10.20	t	32°	27°	30°	Quinine amblyopia field before drinking the coffee
	n	26°	24°	30°	
	u	27°	26°	28°	
	d	24°	17°	20°	
10.42	t	18°	10°	16°	Beginning of the action of the caffeine
	n	20°	14°	15°	
	u	15°	15°	15°	
	d	10°	6°	5°	

		White	Red	Green
10.55	t	6°	4°	5°
	n	8°	7°	8°
	u	10°	10°	10°
	d	3°	2°	3°
11.10	t	5°	4°	5°
	n	7°	6°	7°
	u	10°	10°	10°
	d	0°	0°	0°
11.30	t	0°	0°	0°
	n	5°	5°	5°
	u	6°	6°	5°
	d	0°	0°	0°
12.10	t	18°	16°	11°
	n	20°	18°	16°
	u	20°	18°	18°
	d	15°	11°	8°
12.38	t	30°	24°	30°
	n	26°	20°	26°
	u	28°	25°	28°
	d	20°	15°	20°

The maximum contraction of the field was attained an hour after the ingestion of the coffee, but even in this stage the central vision and color-perception remained perfectly normal. With the ophthalmoscope the retinal arteries were seen to be threadlike and scarcely visible, the veins greatly diminished in calibre, the papilla and retina slightly pale, but clear in each eye. The tension was unchanged. As the effect of the coffee passed off, the retinal vessels regained their former size.

June 18, 1900.—The weather was rainy, so the general condi-

tion of the patient was not as good as on the 12th, and the fields were smaller. On this day the effect of tea, 7*gs* of black tea in 250*gs* of water, was as follows:

		White	Red	Green	
11.10	t	26°	19°	22°	Visual field before drinking the tea. Pulse 71. Retinal arteries small
	n	30°	21°	25°	
	u	22°	19°	20°	
	d	15°	14°	14°	
11.42	t	20°	11°	16°	Tea drank at 11.30. Slight palpitation of the heart and headache. Pulse 80
	n	21°	13°	16°	
	u	20°	10°	10°	
	d	12°	9°	9°	
11.55	t	10°	6°	6°	Retinal arteries thread-like
	n	11°	9°	9°	
	u	10°	7°	7°	
	d	5°	2°	5°	
12.15	t	19°	18°	19°	
	n	20°	17°	18°	
	u	18°	12°	18°	
	d	16°	14°	15°	
12.35	t	24°	20°	20°	Palpitation of the heart gone. Pulse 72. Retinal arteries as before drinking the tea.
	n	28°	21°	25°	
	u	22°	19°	20°	
	d	15°	14°	15°	

No effect was produced by draughts of pure hot water. On June 27, 1900, the patient took at brief intervals three doses of 0.03*gs* of caffeine dissolved in 80*gs* of hot water. The influence of this little dose on the field of vision confirms the theory that caffeine may cause an unnoticed contraction of the retinal vessels. On this day the patient felt very well. She had not taught for thirty-six hours, had slept well, had breakfasted at 6 A.M. on weak coffee, two soft-boiled eggs, and white bread. The examination of the field resulted as follows:

		White	Red	Green	
9.15	t	30°	26°	28°	Field before taking the caffeine
	n	25°	21°	24°	
	u	21°	20°	20°	
	d	15°	15°	15°	
9.27	t	28°	19°	19°	First dose of 0.03*g* caffeine at 9.20
	n	19°	14°	14°	
	u	17°	15°	14°	
	d	19°	7°	7°	
9.52	t	15°	14°	14°	Second dose of caffeine at 9.37
	n	11°	11°	10°	
	u	15°	12°	11°	
	d	8°	7°	8°	

		White	Red	Green	
10.00	t	13°	11°	10°	Third dose of caffeine at 9.58
	n	9°	9°	9°	
	u	12°	11°	12°	
	d	7°	5°	7°	
10.15	t	10°	9°	9°	General condition not affected. Pulse 60. Papilla slightly pale. Retinal arteries not very much narrower than before the caffeine was given
	n	9°	8°	9°	
	u	11°	11°	11°	
	d	5°	4°	5°	
10.50	t	20°	15°	20°	
	n	17°	15°	17°	
	u	19°	14°	15°	
	d	12°	9°	10°	
11.09	t	30°	26°	30°	
	n	20°	16°	21°	
	u	25°	18°	21°	
	d	14°	14°	15°	

The conclusions to be drawn from these observations are in the first place that amaurosis, with a concentric contraction of the visual field persisting for over a year, hemeralopia, and great narrowing of the retinal arteries can be caused by a dose of quinine hitherto judged to be harmless (1.25*g*) in an apparently healthy person with a relaxed vascular system, whose power of resistance has been reduced by insufficient nourishment, and in the second place, that in such a person caffeine, also in small doses (0.1*g*), can temporarily induce a further contraction of the retinal vessels and of the peripheral field, without either influencing the central vision and color-perception, or causing a permanent injury to the peripheral vision in spite of frequent repetition for a year.

VERNAL CATARRH.

By Dr. MARCZEL FALTA, Szeged, Hungary.

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WHERE trachoma is endemic, it is well to turn the attention to vernal catarrh, because the two diseases may easily be mistaken for each other, and it is not incredible that the retrotarsal folds of patients with vernal catarrh may be removed on account of an erroneous diagnosis. I have thought of this simply as a possibility, but now Lang has reported a case in which this accident occurred. Such an operation is apt to be followed by undesirable consequences, because if it had not been performed the eyes would have completely recovered in time.

Vernal catarrh abounds in names; I have found no less than thirteen in literature: phlyctæna pallida, conjunctivitis verrucosa, verrucæ conjunctivæ, conjunctivitis superficialis hypertrophica, conjunctivitis vernalis, conjunctivitis æstivalis, conjunctivitis autumnalis, conjunctivitis printanea, conjunctivitis hypertrophica recurrens, keratitis marginalis hypertrophica, hypertrophia epithelialis æstiva, hypertrophie périkératique, catarrhus printaneus. If this is not enough, I would like to suggest another, ophthalmia hypertrophica, which would indicate the characteristic appearance in every form of the disease. The subjective symptoms affect the entire organ. The denomination "vernal" has no special signification, because trachoma is less marked during the warmer months.

As I have not found a systematic compilation of the

various forms of vernal catarrh, I will briefly describe them, together with a form that has not hitherto been mentioned.

First form: The eye shows no change. The ocular and palpebral conjunctivæ appear perfectly normal. The patient has severe photophobia, and with a strong light a little ciliary injection may be seen. This form is not independent, sooner or later it passes over into one of the other forms. It is the initial stage of the disease, with which probably all forms begin, but it is usually of so brief a duration that it may not come under observation. It may last a month, however, and the diagnosis is very difficult, especially when the disease appears during infancy and the patient can give no account of the subjective symptoms. This form may readily be confounded with the lymphatic eye diseases. The parents of a three-year-old boy brought him to me in May, 1899, because he constantly blinked and was afraid of light. The eyes were a little cloudy, and a little ciliary injection could be made out. The pale face of the little patient, some swollen lymphatic glands, and the ocular symptoms led to a diagnosis of lymphatic eye disease, a diagnosis which seemed to be confirmed by the fact that the house in which he lived was very damp. Calomel was dusted in the eyes and strengthening diet ordered, but the condition grew neither better nor worse. I then recommended change of air. When I saw him next, two months later, his eyes were red, with much photophobia and marked ciliary injection, while the tarsal conjunctiva of the upper lid showed the mosaic-like proliferations of vernal catarrh. The great heat by the Plattensee and the intense light reflected from the surface of the great body of water caused a rapid development of the vernal catarrh, from which the boy continues to suffer.

Second form: In this typical and most frequently observed form we find the well-known degeneration of the tarsal conjunctiva of the upper lid, which presents the appearance of a stone pavement, or mosaic. Goldzieher's term, "snagreened," is expressive. The entire surface is more or less opalescent. The conjunctiva of the lower lid and of the retrotarsal fold is simply catarrhal, or only hyperæmic.

This form is often mistaken for trachoma. A boy, eleven years old, was brought to me at the beginning of the school year, and I found the changes just described on the inner surface of his upper lids. I was sure that at school he would be classed with the trachomatous, and so it proved. He was also advised to enter the trachoma hospital for treatment.

Third form: About the cornea are brownish-red nodules, which sometimes cross the margin and invade the cornea itself. A network of conjunctival vessels is attached to each nodule. The eye is irritated, more or less photophobic, and frequently hyperæmia of the iris with ciliary injection is present. The only other changes present are perhaps a catarrhal condition of the palpebral conjunctiva, with a little mucous secretion. This form is very easily mistaken for phlyctenular keratitis, and its confusion with keratitis fasciculosa is not impossible when the nodules are situated at or near the limbus.

Fourth form: Several flat, broad infiltrations of colloidal consistence in different places in the ocular conjunctiva, with dense vascular networks attached. In one patient suffering from vernal catarrh the infiltration on the right eye was as large as a cent, and was situated 5*mm* from the corneal margin in an upward and outward direction. This form may be confounded with episcleritis.

Fifth form: A mixture of the second and third forms.

Sixth form: A mixture of the second and fourth forms.

Our knowledge regarding vernal catarrh is very imperfect. We do not know why it usually attacks young people, or why in most cases it attacks the male sex. We cannot explain why it is influenced by heat, or by the warm seasons of the year. Bacteriological investigations have also given us no result as yet.

Opinions differ as to its etiology. Schleich and Michel believe it due to general constitutional disease. Schleich says that in these patients the lymphatic glands are enlarged, the tissues are flabby, and there is general paleness. The composition of the blood is abnormal; the number of white corpuscles increased; the hæmoglobin diminished.

Angelucci connects it with abnormality of the vascular system, a disposition to palpitation, to active hyperæmia, and to dilatation of the blood-vessels. He considers that this condition explains why the intensity of the vernal catarrh is lessened or done away with during the winter, because during the colder months the superficial blood-vessels are more contracted. Many ascribe the disease to congenital syphilis, others seek its source in large surfaces of stagnant water.

But the cases which have come under my observation do not conform to any of these theories. Among the patients there have been some weakly ones, but there were not a few that were sound and healthy. All that we positively know about its etiology is that heat plays an important part, but the factor which in the same climate predisposes one and not another to vernal catarrh is unknown. I cannot deny that surfaces of stagnant water may have some influence in conjunction with the heat in producing this disease. It is a sporadic disease, and is found everywhere where there are warm months in the year. According to Dr. Gros, it is common in Algiers, where it was formerly thought they were all cases of trachoma.

The *diagnosis* of vernal catarrh is usually easy. First of all, it is necessary to bear the disease in mind. When the upper lid is everted, the picture is generally classic, and with reasonable care it can hardly be confounded with trachoma. But the diagnosis is difficult if the conjunctiva of the upper lid has undergone no changes. In the first of the above-described forms of cases, even the skilled physician may be deceived, particularly when the disease occurs in little children. The nodules about the cornea in vernal catarrh are very like phlyctenulæ, but they are of a firm consistence and usually have few conjunctival blood-vessels about them. They are of a brownish red color. Phlyctenulæ are not firm, are surrounded by a close network of vessels, and their color is a more violet-red. When seen early their apices are whitish, but later a depression has taken the place of the apex, a condition never seen on a nodule of vernal catarrh.

The form of vernal catarrh which is spread in the ocular

conjunctiva is characterized by a broad infiltrate, and can be mistaken for episcleritis. But episcleritis is usually accompanied by pain, which is not the case in vernal catarrrh. If pressure is made on the infiltrate, the color of the conjunctiva after the pressure is removed is yellowish in episcleritis, of a dirty gray in vernal catarrh.

The history is of the greatest importance in the diagnosis of this disease. When a patient comes with a complaint of constant itching in the eye, vernal catarrh is probably present, but if he adds that the itching annoys him only in warm weather, the diagnosis is certain. As little children cannot describe their subjective sensations we are unable to get this help from them, but since I made the error above described I have always asked, when any suspicion of this condition arose, whether the child rubs its eyes. The invariable answer when the disease is present is that the children rub their eyes violently.

A great help in making the diagnosis, which I have not seen mentioned, is the fact that if we rub the diseased eye quickly and gently with the upper lid, or if after eversion of the lid the proliferations on the tarsal surface of the conjunctiva are rubbed with a little glass rod, the patient will complain of a severe itching. This happens with no other disease. If we rub a trachomatous conjunctiva in this way, the patient may feel pain, but never an itching sensation, and thus in a doubtful case differentiation can be made. This symptom is of special use in cold weather, when the subjective symptoms may be absent and the nodules and proliferations less marked, or absent, for we can produce an itching sensation by rubbing, which is the same as that complained of by the patient in warm weather.

Many *remedies* have been recommended for the treatment of vernal catarrh. Those who believe it dependent on general disease lay most stress on internal medication: iron, iodine, arsenic, etc. Locally, antiseptics are usually recommended in the forms of drops, powders, or ointments, dilute acetic acid, cocaine, cold applications, and massage. Many recommend the removal of the nodules and proliferations. Perret has recently advocated suprarenin as a sure

cure, but at the same time he says that in case of a relapse it is always easy to recommence the treatment, a proviso which at once classes it with many other remedies. Suprarenin, cocaine, xeroform, silver nitrate, and acetic acid are all excellent remedies, but only in winter. With the return of heat comes the relapse. Operative intervention is practicable in only a few special cases, particularly as the disease finally disappears spontaneously. In two cases I have seen the tarsal conjunctiva shaved from the upper lid, but in each there was recurrence. In cases in which there are only one or two nodules in the neighborhood of the cornea, with no other changes whatever, good results may be obtained from their removal.

The *treatment* I employ is as follows: In the winter, if the eyes are quiet, or but slightly catarrhal, I order a 1 % solution of zinc sozoiodolate, or a 1:1000 solution of corrosive sublimate, as a collyrium. In the summer I send the patients to a cool mountain resort. For those that cannot go to such a place I order dark glasses and the constant application of cold compresses, which render the disease much more endurable during the warm months. In addition, every second or third day I evert the upper lid and massage the conjunctiva with yellow ointment on a small glass rod, and then massage the nodules and infiltrates by means of the lid itself.

SUPPURATION OF CICATRICIALLY DEGENERATED CORNEAL TISSUE AND THE CONDITIONS UNDER WHICH MICRO-ORGANISMS PASS THROUGH IT INTO THE INTERIOR OF THE EYE.

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THIS subject has received so little attention that all the literature in regard to it consists of a few short articles to which reference will be made. Statistical data are wanting to prove that suppuration of leucomata is common, but it is an evidence that they are not rare that during the past three years 9 out of 137 cicatricial corneæ, 6.6 %, among the students at the Alexander-Marien-Blindenschule underwent suppuration which penetrated to the deeper parts of the eye and destroyed them. This high percentage was observed among children and adolescents who lived in excellent hygienic surroundings, under the constant supervision of teachers and physicians, and were occupied in clean work. It suggests that under less favorable conditions such affections may be even more frequent, and that it is comparatively easy to inaugurate such an affection on a cicatricial cornea. Three of these nine patients had large, thick partial leucomas which covered almost two thirds of the surface of the cornea and reduced the vision to $\frac{1}{100}$ or $\frac{2}{100}$. The remaining six had total leucoma, complicated in two by hydrophthalmos and great distention of the sclera, but without increased tension. A satisfactory cause could

not be found in a single case. The patients ascribed the attacks to the introduction of a foreign body into the eye, or to rubbing it with the finger. The conjunctiva was normal in all but two who had trachoma. Although only two or three days had elapsed since the beginning of the attack, deep ulcers were present which resisted all treatment. The course of the inflammation was rapid and severe so that the interior of the eye was involved in five or six days. In seven cases the pus perforated externally, in two slower cases the purulent irido-choroiditis resulted in a marked diminution of the size of the eyeball with retention of its former appearance. These few similar cases prove the presence of conditions which favor a rapid development of the pathological process, and its extension into the deeper parts of the eye, conditions which consist of either the absence or a pathological alteration of a constituent part of the normal cornea, but what these really are cannot be determined from clinical observation; only a careful, systematic, experimental investigation of the successive pathological symptoms can explain the etiology and pathogenesis of this disease.

There have been published a number of experimental works on infection of the normal cornea by micro-organisms, but none deal with infection of the cicatricial cornea, the development and dissemination of colonies in such tissue, or their passage through the cornea into the interior of the eye. Neither has the clinical course followed after such an infection been investigated. Sattler was the first to mention suppuration in old corneal cicatrices, as observed in a case in which an abscess in the vitreous followed a suppuration of unknown origin in a scar left after an iridectomy three years before for inflammatory glaucoma. Swanzy later reported six cases of very rapid and violent intraocular suppuration in eyes with large congenital leucomas. He inclined to the idea that prolapse of the iris was an important factor in the etiology of this disease, but gave no satisfactory explanation of its course. This theory was accepted by Alexander, Mules, Priestley Smith, Brudenell Carter, and Abadie, who described similar cases. Leber and Valude examined three such eyes anatomically and referred the

easy entrance of the germs into the eye to the thinness of the cicatrix or the presence of a fistula. Wecker took a similar view, that the involvement of the iris in the scar afforded an easy entrance for micro-organisms. On the other hand, Zehender ascribed an overwhelming importance to the irritation of the iris and ciliary body which is usually present in leucoma adherens. Meyer saw in the constantly irritated adherent iris a place which would exhibit a low degree of resistance to micro-organisms which incline to seize upon an injured organ. Despagnet described eight similar cases and advanced the theory that there were within the eye in a quiescent condition microbes which had been introduced through the perforation of the cornea at the time of the first purulent inflammation, that these were roused into activity by an exacerbation of the irritation constantly present in a leucoma adherens. Wagenmann studied microscopically thirteen and clinically eighteen similar cases, and concluded that a corneal cicatrix which had become secondarily infected was the point of attack. But his cases were not conclusive because almost all the eyes he studied were in the last stages of panophthalmitis. From his microscopic pictures one would think the suppuration came from the deep parts of the eye and worked out in the direction of the scar rather than the reverse, and the clinical course of his cases was not in accord with his theory. Although his investigations threw some light on the subject they did not determine how the microbes entered the eye, or what rôle the cicatrix plays in the transmission of the infection. Terson, father and son, reported six cases and thought the microbes entered along the entangled iris and that their entrance was favored by the thin and easily injured epithelial covering of the cicatrix. Fuchs, Wecker, and Gayet ascribed the vulnerability of the epithelium to insufficient nutrition of the cicatricial tissue. None of these authors proves his theory, or explains the wandering of the micro-organisms from the scar into the interior of the eye, the resistance exercised by any single tissue in the cicatrix, the part taken by the adherent iris, or the cessation of the suppuration in exceptional cases. To obtain explana-

tions of these points we undertook the following experiments on the eyes of rabbits.

Cicatrices were produced by deep cauterization of the central or upper part of the cornea so as to make an artificial leucoma covering $\frac{1}{3}$ to $\frac{1}{2}$ of its surface, and the inoculations were made four months later, although the scars were completely organized in less than two months. Three kinds of leucomas were produced: (*a*) simple superficial, (*b*) with adherent iris, and (*c*) involving the whole thickness of the cornea without the iris. The inoculations were made by means of injections of cultures into the cicatricial tissue without perforating it, an easy matter as the scar was thicker than the normal cornea. Bouillon cultures of staphylococcus aureus and streptococcus pyogenes were used. The virulence of the streptococcus was uniformly such that 0.1*c cm* injected into the blood would kill a rabbit in from twenty-four to thirty-six hours. The staphylococcus cultures were of two grades of virulence: one would kill a rabbit in four days, the other would only cause a rise in temperature to 40.5° C. Such a quantity of the culture would be injected into the cicatrix and into a normal cornea to act as a control, that the circular opacity about the point of injection measured from 1 to 1.5*mm.* The eyes were removed for examination five, ten, eighteen, twenty-four, thirty-two, forty-eight, and seventy-two hours after the infection, but not afterward, because at the end of three days symptoms of systemic poisoning appeared and interfered with the precision of the experiments. The enucleated eyes were placed in a 5% solution of formalin for twenty-four hours, and then embedded in celloidin in the usual way. The staining was with hæmatoxylin eosin, by Van Gieson's method, by Gram's method, and, to differentiate Descemet's membrane, by Weigert's method.

To demonstrate the protective power of the epithelium of the cicatricial cornea against the penetration of microbes, we placed strong cultures of staphylococci and streptococci in the conjunctival sacs of ten rabbits. In each case an acute catarrhal conjunctivitis was induced which ran its course in three days and passed off without having caused

any injury to the eye. This proved that the epithelium over a corneal cicatrix four months old is a positive protection against infectious germs which may find their way into the conjunctival sac, even though they are of considerable virulence.

In forty experiments inoculation of stronger and weaker cultures of the staphylococcus aureus were made into cicatricial and normal corneæ. This produced a typical ulcer with hypopyon, and no distinction could be made in the course of the disease between those produced by the two cultures. The first symptoms appeared five hours after the injection, at a time when there were no symptoms in the normal cornea. The ulcer spread over the whole leucoma, penetrated deeply while tending to heal at the margins of the scar, and did not invade the neighboring tissues, thus showing the tendency of the leucoma to break down under the influence of staphylococci. At the end of the same length of time the ulcer on the normal cornea remained confined to the superficial layers and assumed a characteristic appearance as a small ring-shaped ulcer at the periphery of the cornea.

In thirty experiments cultures of streptococcus pyogenes were used which were more toxic, so that the duration of the experiments was reduced to two days. Six to ten hours after the injection there was a violent reaction on the part of the eye, with an infiltration of the cornea at the point of injection which rapidly developed into an abscess, and in two days became changed to a deep ulcer, associated with a hypopyon that filled the anterior chamber. The superficial leucoma was infiltrated with pus at the end of twenty-four hours. These results show that (1) the streptococcus, like the staphylococcus, possesses the power to quickly destroy cicatricial corneal tissue; (2) with simultaneous introduction of a culture into the two eyes of the same animal the reaction in the leucomatous eye is well marked at the end of six hours, while it is only beginning, or altogether absent, in the one with a normal cornea; (3) twenty-four hours after the infection the leucoma is infiltrated with pus, while in the sound eye the purulent infil-

tration is confined to the place of inoculation; (4) no characteristic superficial ring-shaped ulcer like those produced by staphylococci is caused in the normal cornea by streptococci.

We pass now to the microscopical appearances. Five hours after inoculation of the cicatrix with a strong culture of staphylococcus, the corneal epithelium at the place of injection was destroyed, so that Bowman's membrane was covered with detritus and the nuclei of the remaining cells were scarcely stained. The cicatricial tissue was œdematous and swollen. The microbes had multiplied and formed a compact mass in the superficial layers of the leucoma with little aggregations in its neighborhood. The infiltration of the leucoma with leucocytes was confined at first to the limbus of the cornea. The exudate in the anterior chamber was a network of fibrin containing a small number of leucocytes, especially at the angle of the chamber.

Ten hours later, the microbes were still confined to the most superficial layers, the infiltration of leucocytes was fairly well marked, especially in the limbus corneæ and Fontana's space. The iris was inflamed.

After twenty hours, the microbes were in the deep layers of the cicatrix closely surrounded by a dense ring of infiltration. The cells on Descemet's membrane were vacuolized and swollen. The iris was actively involved and thick bands of leucocytes extended from its pupillary margin through the anterior chamber to the place on the posterior surface of the cornea where the colonies of microbes lay in the scar. The leucocytes were more numerous in the anterior chamber than in the loops of Fontana's space. The hypopyon contained many pus cells.

After forty-eight hours the microbes had spread through all the layers of the cicatrix, formed a layer along Descemet's membrane where it was present, and where it was destroyed had passed through into the anterior chamber and the exudate. The ring of infiltration in the corneal tissue was rather distant from the colonies after inoculation of a very virulent culture, and the intermediate space was necrotic. After inoculation of a weak culture the ring was

close to the microbes, an evidence of the paralytic action of toxines on leucocytes. The limbus corneæ, the loops of Fontana's space, the iris, and the ciliary body were full of leucocytes. The endothelium of Descemet's membrane was preserved only in places. The anterior chamber was overrun with microbes which lay between the cells of the exudate, formed an uninterrupted layer on the anterior surface of the lens capsule, and had penetrated the zonule of Zinn. (The posterior segments of the eyes were not examined.)

The changes found after three days showed a great destruction of the cicatricial tissue by ulceration and a more extended proliferation of the colonies of microbes.

When a weaker culture was used there was a more energetic movement of the leucocytes, so that the ring of infiltration was more marked and invested the colonies of microbes more closely.

Thus we see that the staphylococci have passed through the leucomatous tissue by the end of the second day, that this transition has taken place exclusively where Descemet's membrane has been destroyed, and that the latter wherever uninjured forms an impassable barrier to their progress. Therefore the lesion itself must be considered the essential condition for the infection of the interior of the eye. The micro-organisms can also pass through the cicatricial tissue, whatever may be its density, without first destroying it. In some cases the microbes are unable to penetrate into the interior of the eye, even when Descemet's membrane has been injured, because the ring of infiltration has become interposed between the place of inoculation and the portion of the scar corresponding to the destroyed place in the membrane (see Fig. 1). This is observed only when the virulence of the culture is not great and the place of inoculation is at some distance from the place where Descemet's membrane is injured, conditions which give the protective ring of infiltration time to develop.

Twenty-three experiments were undertaken for the comparative study of the microscopical appearances produced in the same length of time in cicatricial and normal corneæ

in the same animal and with the same culture of staphylococci.

In the cicatricial cornea after twenty-four hours the epithelium about the place of inoculation was destroyed, Bowman's capsule could not be recognized, the tissue was covered with detritus, the colonies had proliferated considerably along the scar tissue and had reached the middle layers of the cornea. The infiltration of the cornea with leucocytes was fairly well marked, but the space between it and the microbes was quite free. The endothelium of Descemet's membrane was preserved. In the anterior chamber was a fibrinous exudate with clusters of cells between the fibres. There were many leucocytes in Fontana's space and the iris.

In the sound eye after the same length of time there was only a loss of epithelium and a deposit of detritus on Bowman's membrane, which had not been destroyed. The microbes were confined to the most superficial layers of the cornea with the ring of infiltration not far distant. The infiltration of the cornea with leucocytes outside the zone of infiltration was well marked. The endothelium of Descemet's membrane was unchanged. In the anterior chamber was an exudate of coagulated fibrin with a few leucocytes. The latter were not numerous in Fontana's space, and the iris was scarcely affected. In the leucoma the microbes had reached the middle layer, in the normal cornea they were still in the superficial. The inflammatory symptoms were much more marked in the leucomatous eye.

In the sound eye after forty-eight hours the epithelium had been destroyed over all the necrotic zone near the colonies, which occupied only the anterior third of the thickness of the cornea. The ring of infiltration was well marked and situated at a considerable distance from where the microbes were aggregated. The endothelium of Descemet's membrane was but little changed. The exudate in the anterior chamber contained many pus cells. The iris and ciliary body were much injected and infiltrated with leucocytes, while the latter were also scattered about in the zonule of Zinn and the vitreous near the posterior capsule. In the

leucomatous eye the epithelium was gone over the extent of the necrotic zone. The colonies of microbes had greatly multiplied so as to form an unbroken layer superficially and separate colonies at a deeper level. They had passed through the cicatrix in the cornea and lay in the midst of the purulent exudate which filled the anterior chamber, had formed deposits on the anterior surface of the lens capsule, as well as in the zonule of Zinn, and had penetrated into the posterior portion of the eye where they lay on the posterior surface of the lens capsule. The ring of infiltration was not far from the collection of microbes, at least when the weaker culture had been employed. The cicatricial tissue in the neighborhood of the colonies and the endothelium of Descemet's membrane were necrotic. The exudate in the anterior and posterior chambers contained many pus cells, and the ciliary body was infiltrated with leucocytes.

Thus we see that after forty-eight hours the microbes have involved only the anterior third of the thickness of the normal cornea, but have passed through the cicatricial cornea and settled in the exudate in the anterior chamber. Sometimes colonies can be seen in the posterior part of the eye. After three days the pathological changes in the eye with normal cornea differed little from those seen after forty-eight hours, but in the leucomatous eye there had been a great proliferation of colonies in the leucoma, the anterior chamber, and the posterior part of the eye, with infiltration of leucocytes in the zonule of Zinn and the more posterior parts. Consequently it is evident that the normal cornea affords a much greater resistance than the cicatricial to the spreading of the inoculated staphylococci.

When *streptococci* were employed, the epithelium was uninjured ten hours after the inoculation except at the place of injection. The corneal tissue was uncommonly œdematous, so that on section it appeared to be of more than double its normal thickness. The infiltration was strongly marked about the limbus corneæ, while about the place of inoculation it was present only in the superficial layers. The colonies showed a much more energetic deep growth

than those of *staphylococci*. They had already penetrated through the cicatrix and in some preparations colonies could be found in the exudate in the anterior chamber, which was formed of fibrin with a few pus cells, particularly at the angle and on the iris. Fontana's space was packed with leucocytes.

After eighteen hours the corneal tissue was infiltrated throughout with leucocytes, but no typical ring could be seen. The endothelium of Descemet's membrane was destroyed. In the cicatricial tissue the microbes could be found only on its posterior surface, and their principal colonies were in the anterior chamber surrounded by pus cells. The iris and ciliary body were moderately injected and infiltrated.

All changes were greatly advanced at the end of twenty-four hours. The epithelium and superficial layers of the cicatrix were destroyed to a considerable extent. The scar tissue was much infiltrated and contained colonies of microbes which extended through it, penetrated the iris and the zonule of Zinn, and lay on the posterior surface of the lens capsule. The exudate in the anterior chamber contained an enormous number of pus cells.

After thirty-six hours the only further change was an increased multiplication of colonies in the exudate in the anterior chamber and, after forty-eight hours, in the posterior portion of the eye.

By comparison of the action of streptococci on normal and cicatricial corneæ in the same animal, we found that eighteen hours after the infection there were in the eye with a sound cornea only a slight absence of epithelium about the place of inoculation and a rather poor development of colonies of microbes, which were surrounded by a slight infiltration of leucocytes only on Bowman's membrane. Fontana's space, the iris, and the fibrinous exudate in the anterior chamber contained only an occasional leucocyte. But in the eye with a cicatricial cornea all the layers of the scar were permeated with leucocytes, the microbes were already in the anterior chamber and the exudate, there was a severe iritis, and Fontana's space was filled with leucocytes.

After twenty-four hours the inflammation in the sound

eye showed little tendency to advance, and while the microbes had penetrated somewhat more deeply they had not reached the middle layers of the cornea. In the leucomatous eye, on the contrary, the inflammation was well marked. A considerable extent of the epithelium was destroyed, and the upper layers of the cicatrix near the colonies were necrotic. The endothelium of Descemet's membrane was destroyed and the microbes had penetrated into the iris, and the posterior part of the globe.

At the end of two days the microbes were still in the middle layers of the sound eye, the infiltration of leucocytes was more marked, especially when the colonies were near the limbus, the endothelium of Descemet's membrane was destroyed, and the exudate in the anterior chamber consisted of fibrin with a very small quantity of leucocytes but no pus cells. In the leucomatous eye the inflammatory changes were incomparably farther advanced, but the principal difference lay in the great development of colonies both in the exudate in the anterior chamber and in the posterior section of the eye.

It is evident that streptococci are more energetic than staphylococci, and that they pass through a cicatrix in a way which proves the latter to possess only a slight power of resistance as compared with the normal cornea. Their ability to penetrate tissues quickly must depend on the high degree of their virulence.

From these observations we draw the following conclusions:

1. A purulent infection which begins in a corneal cicatrix quickly spreads to the deeper parts of the eye.

2. The clinical course of this disease is typical, and its characteristic symptoms seem to be a remarkable disproportion between the insignificant injury with which it is started and its rapidity and violence.

3. With very rare exceptions the disease is uninfluenced by treatment and results in the loss of the eye.

4. No explanation of its characteristic course can be obtained clinically. The existing theories fail to explain all symptoms and seem to be disputable.

5. The epithelium of the cicatricial cornea, while intact, serves as a protection against the entrance of infective germs from the conjunctival sac into the deeper tissues.

6. Very virulent cultures of streptococci and staphylococci in the conjunctival sac cause only an acute catarrh of the mucous membrane, which rapidly passes away without producing any injury to the eye.

7. The introduction of a pure bouillon culture of staphylococci into the superficial layers of a leucoma is productive of a typical corneal ulcer with a precedent abscess.

8. The characteristic points of these ulcers appear to be the fixed course, the ring-like arrangement, and the tendency to hypopyon.

9. The virulence of the culture is an important feature.

10. The introduction of a pure bouillon culture of streptococci is productive of an infiltration, which quickly changes to an abscess and, on the second day, to an ulcer with hypopyon. No clinical difference exists between a hypopyon caused by streptococci and one due to staphylococci.

11. After the inoculation of a culture of either staphylococci or streptococci into both the normal and the cicatricial cornea of the same animal, there is a much more rapid development of symptoms in the eye with the cicatricial cornea than in the other.

12. The cicatricial cornea also melts away much more rapidly than the normal under the influence of these cultures.

13. After the introduction of cultures of staphylococci into the normal cornea there is to be observed, in addition to a superficial ulceration at the point of inoculation, a ring-shaped ulcer with a characteristic deposit at the periphery of the cornea. Streptococci do not produce a similar ulcer in the normal cornea.

14. The ulceration produced by the inoculation of staphylococci and streptococci in the superficial layers of the cornea extends in the leucomatous chiefly into the depths of the scar, while in the normal, after an equal lapse of time, it is confined to the superficial layers without involvement of the deeper.

15. The micro-organisms have passed through the corneal cicatrix into the anterior chamber at a time when the ulceration has only just involved the most superficial layers of the leucoma; therefore the destruction of the cicatrix is not necessary for their passage through it, but only a solution of continuity in its epithelial covering.

16. Colonies of staphylococci of the virulence used in these experiments have passed through the leucoma into the anterior chamber at the end of the second day after inoculation.

17. Two days after inoculation of the normal cornea with staphylococci of the same virulence the colonies have not penetrated deeper than its middle layers, and this proves that their movement is restricted in the normal as compared with the cicatricial cornea.

18. Colonies of streptococci have passed through the cicatricial cornea into the anterior chamber ten hours after their superficial inoculation.

19. In the normal cornea the colonies of streptococci are still limited to the place of inoculation after ten hours.

20. A defect in Descemet's membrane, at a point corresponding to the place of inoculation in the superficial layer of the leucoma, appears to be an indispensable condition for the passage of the micro-organisms through the cicatrix into the deeper parts of the eye.

21. If the inoculation is made at a point not corresponding to the defect in Descemet's membrane, but at some distance away, the microbes cannot penetrate into the deeper parts of the eyeball, even after they have become well developed in the leucomatous tissue, and so a general infection is not brought about.

22. This restraint of the micro-organisms appears to be exercised by the ring of infiltration which is formed between the colonies of microbes and the place in the cicatrix which corresponds to the defect in Descemet's membrane.

23. A passage of the microbes into the anterior chamber could not be demonstrated when, though the leucomata were extensive, Descemet's membrane was uninjured, but

the leucomatous tissue ulcerated much more rapidly than the normal.

24. The density of the cicatrix and the absence of a fistula afforded no hindrance to the passage of the micro-organisms.

25. The entanglement of the iris in the cicatrix does not influence the general course of the disease.

26. The iris plays an important part in the formation of the hypopyon.

Explanation of the Plates.

All were drawn from preparations equally magnified (Reichert, obj. 2, oc. 2).

Fig. 1.—Proliferation of colonies of staphylococci two days after the inoculation of the weaker culture in the superficial layer of a leucoma. st. = colonies of staphylococci. l = ring of infiltration, which hinders the passage of microbes into the anterior chamber. d = Descemet's membrane, destroyed by the cautery. i = iris entangled in a leucoma. h = hypopyon, consisting of a mass of pus cells.

Fig. 2.—Development of colonies of staphylococci in a leucoma and the anterior chamber two days after inoculation of the weaker culture. st. = colonies in the leucoma, the anterior chamber, and the anterior surface of the lens capsule. The proliferation of the colonies in the zonule of Zinn can be seen. l = ring of infiltration. z = zonule of Zinn. c = capsule of the lens.

Fig. 3.—Another portion of the preparation shown in Fig. 2, showing the development of the colonies in the zonule of Zinn. Colonies in the posterior section of the eye can be seen along the posterior surface of the lens capsule. The letters indicate the same as in Fig. 2.

Fig. 4.—Proliferation of colonies of staphylococci in the leucoma and the beginning of their passage into the anterior chamber two days after inoculation of the weaker culture. st. = colonies of staphylococci. h = exudate into the anterior chamber.

Fig. 5.—Proliferation of colonies of staphylococci in the leucoma and the anterior chamber three days after inoculation of the more virulent culture. st. = colonies of staphylococci. l = ring of infiltration. l c = lens.

Fig. 6.—Proliferation of the staphylococci in the normal cornea three days after inoculation. There was a leucoma in the other eye of the rabbit, from which the preparation depicted in Fig. 5 was obtained. The inoculation was performed in the two eyes at the same time. As the picture shows, the colonies of staphylococci had not penetrated deeper than the middle layers. st. = colonies of staphylococci. l = ring of infiltration. h = hypopyon.

TREATMENT OF CONGENITAL AND INFANTILE HYDROPHTHALMUS.

By Dr. CARL SCHOENEMANN of St. Johann-Saarbrücken.

Translated from Vol. XLII., October, 1900, German Edition, by Dr. Matthias Lanckton Foster.

In view of the difference of opinion regarding the curability of hydrophthalmus and the treatment which should be employed, the histories of seven cases successfully treated in the last eight years, and under observation for some time after cessation of treatment, may be of interest. In most text-books the curability of this disease is still considered doubtful. Although it is commonly accepted to be infantile glaucoma, very few authors, like Schweigger and Stölting, lay the stress on the importance of early operation which would be expected, and on this account, as well as the greater difficulty of performing an iridectomy, operative treatment has not received the attention it deserves. There are not lacking reports of favorable results obtained in this manner, but these have usually failed to present a history of prolonged observation after operation which would show the improvement or cure to be permanent. At the Eighth International Ophthalmological Congress at Edinburgh, Stölting made a particularly valuable contribution to this subject. He reported six cases brought to a standstill or cured which had been under observation afterward for considerable time, two of them for five and a half years. He had performed sclerotomy in all, had been obliged to repeat the operation in each case except one,

and recommended this procedure as less dangerous than iridectomy. In the discussion which followed, Gutmann alone advocated iridectomy, with which he had obtained several good results, of the permanency of which he unfortunately did not speak. But he emphasized the fact that he avoided the dangers of the peripheral section by making the incision in the cornea. Dufour said that he recommended operative interference only when eserine and pilocarpine had failed. In his opinion, a spontaneous improvement of the hydrophthalmus usually took place in the fourth year of life. I have never seen a spontaneous cure or improvement of this disease, though I have repeatedly been able to prove that it had come to a standstill in totally blind eyes. It is not unlikely that there has been a certain amount of confusion between the spontaneous healing of hydrophthalmus and keratoglobus, an affection met with more rarely, which is characterized by an abnormally large cornea and a very deep anterior chamber, but with no stretching or thinning of the sclera, particularly as in many text-books the two conditions are not separated.

Hydrophthalmus is almost universally looked upon as a congenital disease, and this idea was expressed at the Edinburgh Congress, but it certainly does appear in later child life. In evidence of this may be quoted two cases of Schweigger's and two cases reported below, Nos. 3 and 6.

The dangers which attend an operation in hydrophthalmus are those of dislocation of the lens, prolapse of the iris and of the vitreous, and, more rarely, that of intraocular hemorrhage. These dangers seem to be so great that even to-day hydrophthalmus is still a *noli me tangere* to many of my colleagues. Particularly iridectomy, which most of my colleagues consider the curative treatment for inflammatory glaucoma of adults, is considered so dangerous that Haab, Stölting, and Thier have recommended sclerotomy. I have obtained both bad and good results from both methods. But since 1892 I have avoided making a peripheral section, and have had no bad results in seven cases, comprising thirteen eyes, though in two cases, Nos. 4 and 5, the unusually great hydrophthalmus occasioned grave prognostic

fears. Before I begin the narrative of the individual cases I wish to say that the operations were all performed under general anæsthesia. The eyes were bandaged for eight or ten days and eserine instilled when the dressings were changed. It is difficult to keep the dressing securely in place on account of the restlessness of the little patients, but this may be accomplished by means of strips of rubber plaster over the dressing, and then covering the whole with a three-cornered cloth made into the form of a cap.

Case 1.—K. N., five months old, admitted Dec. 1, 1892, with pronounced hydrophthalmus of each eye. There was marked circumcorneal injection, cloudy corneæ, fairly large pupils, deep anterior chambers, and plus tension. After use of eserine for two days the pupils were only a little smaller and the corneæ no clearer. Iridectomy on each eye Dec. 4th. Recovery normal. Discharged Dec. 19th. On this day the eyes were quiet, tension not plus, the anterior portions of the eyes were not appreciably smaller, the corneæ were clear, the pupils of medium size, reacting well to light. The same condition was found on all examinations afterward. The child has since been seen repeatedly, the last time in 1898, when it was noted that there was no discoloration of the sclera, the refractive media were clear, the pupils reacted well to light, the papillæ were normal. With correction of a myopia of 2 dioptres, vision was from $\frac{6}{12}$ to $\frac{6}{9}$.

Case 2.—H. K., three and a half months old, admitted Feb 12, 1894. Marked distention of the sclera of each eye about the cornea, rendering its margin indistinct. Diffuse, uneven cloudiness of the corneæ. Anterior chambers deep. Pupils scarcely to be seen. Tension plus. Eserine caused a slight clearing of the corneæ. Iridectomy on each eye Feb. 13th. Recovery normal. Discharged Feb. 27th, with both corneæ clear, except for some circumscribed opacities; tension normal and good pupillary reaction. The same condition was found on subsequent examinations. The child was afterward seen repeatedly, the last time on June 7, 1898. The cornea still appeared a little enlarged and perfectly clear, except for some circumscribed opacities. The sclera about the cornea was in places slate-colored. Tension normal. No cupping of the disk. Vision good, as far as could be determined in a four-year-old child.

Case 3.—J. S., eight years old, admitted Oct. 7, 1894. Had

always been well and had attended school until a year before, when his right eye became inflamed and began to increase in size. After a few months it became blind. Six weeks ago, the same disease appeared in his left eye. There was pronounced hydrophthalmus of the right eye, with marked circumcorneal injection, smoky cloudiness of the cornea in places, plus tension, tender eyeball, very deep anterior chamber, a little hyphæma, discolored iris, and adhesion of the pupillary margin to the chalky lens. There was no perception of light. Enucleation was proposed and declined, so optico-ciliary resection was performed on the 18th. The inflammatory symptoms then quieted and there was a slight shrinking of the anterior portion of the globe.

Left eye: Slight circumcorneal injection, scleral limbus distended, but not discolored; cornea enlarged, its margin not well defined, with a smoky cloudiness, most dense in its middle. Tension plus. Pupil dilated. Eserine reduced the size of the pupil and slightly the cloudiness of the cornea, but had no noticeable effect on the tension. Vision before and after eserine, $\frac{1}{24}$ to $\frac{1}{30}$. Iridectomy Oct. 25th. Recovery normal. Discharged Nov. 2d. The cornea was perfectly clear, with well-defined margin, its size apparently only a little lessened. Tension normal. No cupping of the disk. Myopia 3.5 dioptres. Vision $\frac{6}{12}$. The same condition was found on repeated examinations, the last on March 17, 1899.

Case 4.—J. Z., six days old, admitted March 6, 1895, with a high degree of hydrophthalmus of each eye. The eyeballs were so large that the lids could be closed over them only with difficulty. On each side the scleral limbus was much stretched and bluish, the cornea diffusely cloudy, its epithelium softened. The pupils could not be seen. Beside instillations of eserine, a paracentesis was made into the anterior chamber, which induced a sufficient clearing of the cornea to permit an iridectomy to be done the next day. The operation was difficult, on account of the indistinctness with which the pupillary margin could be seen. After a pressure bandage had been worn two days there was a marked decrease in the glaucomatous symptoms, and the corneæ were clear enough to disclose a secondary cataract in the right eye, as well as several posterior synechiæ. At the bottom of each anterior chamber was a little layer of grayish-yellow exudate, which had disappeared at the next dressing. Ten days

later there was a slight recurrence of the glaucomatous symptoms, which were not to be controlled by eserine, so that on the fourteenth day a paracentesis was made into each anterior chamber, associated in the right eye with discission of the secondary cataract. After that the progress was good, and the patient was discharged April 4th, but eserine was instilled daily for several weeks afterward. On April 27th, the corneæ were clear, with the exception of some circumscribed opacities, the scleral limbus clearly defined, the anterior portions of the eyeballs and of the corneæ distinctly smaller; the pupils, under eserine, small. On May 31st, the same conditions were present. Eserine had been discontinued for some time, and the pupils were normal, aside from the traces of secondary cataract. The child was afterward seen repeatedly, the last time on May 5, 1898. It had grown well and showed no real fundus change. As well as the vision could be determined in a three-year-old child it seemed to be good.

Case 5.—I. G., twelve days old, admitted Feb. 3, 1896, with a high degree of hydrophthalmus. The symptoms and course were the same as in Case 4. In this case also a paracentesis was necessary to reduce the cloudiness of the cornea so that the iris could be seen and an iridectomy performed. In the left eye was a shrunken cataract, adherent to the iris. Paracentesis also needed to be performed twice after the iridectomy, on the twelfth and seventeenth days, before the glaucomatous symptoms completely disappeared. Discission was also performed in the left eye coincidentally with the paracentesis. Discharged March 7th. Eserine was instilled daily for several weeks longer. On April 6th, both eyes were perfectly quiet, tension not plus; corneæ clear, except for some circumscribed opacities, each cornea of a diameter of 14*mm*, in spite of the evident diminution of the anterior portion of the eyeball. The right pupil was of medium size, slightly displaced downward and outward. The left pupil was rather small and clear, its margins here and there adherent to the remains of the cataract. Since then the child has grown well, and has been seen repeatedly, the last time on Feb. 6, 1900. No change had appeared in the fundus. The vision was good. The right eye was myopic 8 dioptres.

Case 6.—P. K., five years old, admitted Oct. 4, 1896. His mother stated that his left eye began to increase in size a year and a half before and to become red, painful, and photophobic.

Six months later the same symptoms appeared in the right eye. There was a high degree of hydrophthalmus in each eye, with great circumcorneal injection and photophobia. The scleral limbus was much stretched and the left in particular was bluish. The corneæ, especially the left, were smoky, increased in size, and had ill-defined margins. In the lower quadrant of the left cornea was an ulcer, probably traumatic. The pupils were dilated and responded a little to eserine, the left less than the right. The right cornea became somewhat clearer under the influence of eserine. Iridectomy on each eye Oct. 6th. Recovery in the right eye normal. In the left the glaucomatous symptoms did not completely abate, and increased after ten days. Paracentesis was performed Oct. 17th, and again on Oct. 22d, but as there was no improvement a second iridectomy, downward, was made Oct. 27th, which was followed by a rapid and complete disappearance of the glaucomatous symptoms. Discharged Nov. 6th. Both eyes quiet, tension normal. Right eye: cornea smaller and clear, pupil normal, no cupping of disk, vision good. Left eye: cornea no smaller, with circumscribed opacities in places, pupil larger than the right and reacting more slowly, disk cupped. Eserine was continued two weeks longer in the right eye, four weeks in the left. No changes were noted at several subsequent examinations. The child was able to go to school in 1898. The last examination was on Nov. 17, 1899, when the condition was found to be the same as on Nov. 6, 1896. The right eye was emmetropic, vision $\frac{6}{12}$. The left eye had compound myopic astigmatism; vision, with correction, $\frac{1}{8}$ to $\frac{1}{3}$. Contraction of the field upward and inward.

Case 7.—J. K., two and a half years old, admitted Oct. 6, 1899. Duration of disease said to be a year. Marked photophobia and circumcorneal injection. Scleral limbus much distended. Corneæ increased in size, cloudy, the epithelium softened. As operation was at first refused, eserine was tried in conjunction with paracentesis of the anterior chamber, which was repeated three times in the course of four weeks. As only temporary benefit could be obtained in this way, an iridectomy was finally consented to and was performed on Nov. 5th. Recovery was normal, and the patient discharged Nov. 15th. There was still a slight photophobia of each eye and also a little circumscribed opacity of the cornea. Tension normal. Corneæ slightly smaller. Eserine was continued six weeks longer. The last examination

was Sept. 7, 1900, when the eyes were quiet and the condition the same as on Nov. 15, 1899. As far as could be determined the vision was good. No cupping of the disk.

With the exception of the last, which has been under observation only eleven months, all of these cases have been watched for periods varying from three to six years, and it may reasonably be expected that the benefit in the last one will likewise prove permanent. It cannot be disputed that it is right to say that these cases have been cured when the permanency of the arrest of the hydrophthalmus has been observed for so many years. The curative factor was the iridectomy beyond a doubt, the earlier it was undertaken the more satisfactory were the results produced, and the operation is not dangerous, if performed according to Schweigger's method.

METASTATIC CARCINOMA OF IRIS AND CILIARY BODY.[1]

By Dr. COLMAN W. CUTLER, New York.

(*With two figures on Text-Plate IX.*)

This case is that of a nurse, Miss A. T., aged thirty-three, seen first in Sept., 1901. The early history has to do chiefly with refraction and with very curious attacks of migraine or sensory epilepsy, with some indications of a focal disturbance in the right hemisphere. There had been pain in and back of the right eye for several years. The refraction did not vary materially in the two eyes, and the discomfort was not relieved by glasses. These symptoms were not explained by the autopsy, and certainly have nothing to do with the question of the ocular metastasis. April 12, 1904, at the last examination previous to the operation, the functions of the eyes were normal, and there was no abnormal appearance externally or internally.

The mother and a sister are said to have died of cancer. The patient had a cancer of the breast removed in 1903, by Dr. Runyon, of South Orange. I am indebted to Dr. Ransom, of Maplewood, N. J., for the following notes. In a letter, dated Sept. 5, 1904, he says:

"Three weeks ago she began to suffer with pain in her left eye, top of head, and side of face. The fundus and media were then absolutely clear. The pain increased, failed to yield to local measures and opiates. She had nausea and vomiting, complained of dizziness and some numbness of right arm and leg, with no loss of reflexes. On Tuesday last a spot appeared on the iris, the conjunctival injection increased, pain became local-

[1] Read in abstract at the meeting of the American Ophthalmological Society, Boston, May, 1905.

To Illustrate Dr. Cutler's Article.

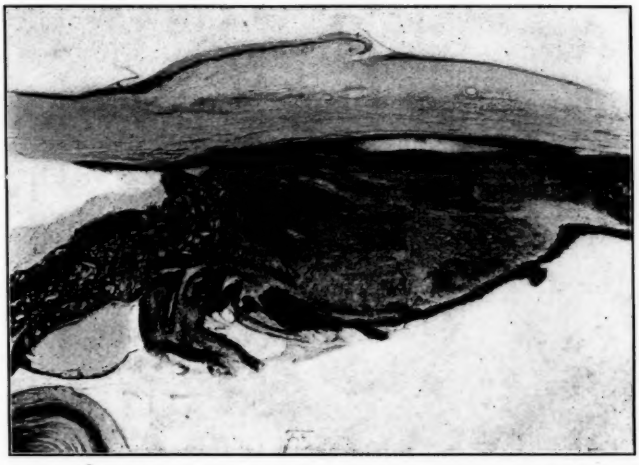

Fig. 1.—Metastatic Carcinoma. Ciliary Body and Iris. × 30.

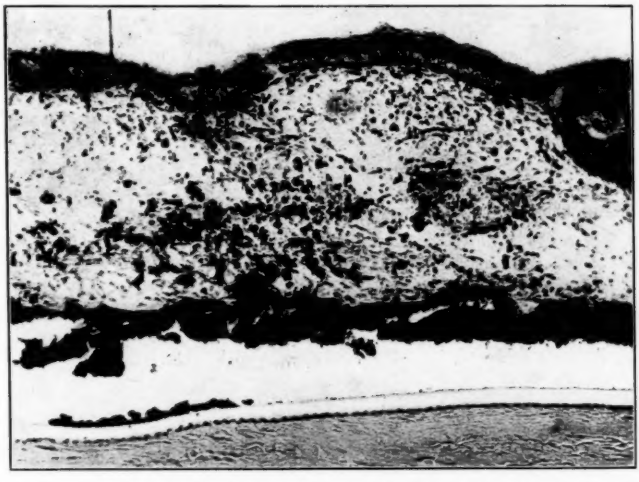

Fig. 2.—Metastatic Carcinoma. Ciliary Body and Iris showing columnar form assumed by the cells on anterior surface of Iris.

ized in the eyes, and vision markedly impaired. The spot has increased steadily in size, and pain has increased in spite of all efforts to alleviate it."

I saw the patient the following day, one week after the growth had been discovered. Cornea was clear, pupil half dilated under atropine, with no synechiæ.

Occupying about half the width of the visible iris was a dull grayish mass, slightly elevated, not vascular, and not sharply defined. Media clear, fundus normal. The patient was cachectic, with a pretty general dissemination of the cancer, which, after remaining a year latent, had spread with terrible malignancy.

The lymph glands over the parotid and back of the ear were involved, and there was a large hard mass adherent to bone or periosteum at the vertex of the skull.

The eye was removed to relieve the atrocious pain which was due to the tumor, as tension was normal, and there was no iritis, and the result justified the operation. The patient was much more comfortable, but in a week a large mass was felt in the liver, and within a month she died of general carcinomatosis.

The report of the pathologist, Dr. Dixon, is as follows:

"When the globe was divided, a tumor was found, which macroscopically appeared as a white elevation, occupying the ciliary body on the temporal side, and extending into the iris an apparent distance of 3*mm*. The base of the tumor in the horizontal plane of the globe measured 9*mm*, extreme elevation 3*mm*.

"Microscopically, sections showed a growth composed of epithelial cells, beginning as a very thin layer just at the end of the choroid and origin of the ciliary body, the outer pigment layer intervening between the growth and the sclera. Passing forward, it invested the ciliary body and processes, the root of the iris, and Fontana's spaces, reaching its greatest elevation 2.25*mm* behind the root of the iris. The stroma of the iris in the vicinity of the tumor was thickened considerably in horizontal, or transverse, section, by the tumor cells which broke through its uveal layer into the posterior chamber near the root. The cells were more or less numerous in all parts of the iris in sections examined, but they became less in number as the pupil was approached. A peculiar feature in connection with this portion of the growth was that the cells were continued as a thin layer over

the anterior surface of the iris, and where thinnest had almost a columnar appearance. They also lined Descemet's membrane for a short distance.

"The sclera was not involved nor much irritated, except in the vicinity of some of the vessels, about which were a few round cells.

"The lens showed evidence of beginning cataract. The balance of the eye was normal.

"I regard your case as metastatic carcinoma of the ciliary body and iris."

Dr. F. C. Wood writes from Dr. Prudden's laboratory:

"I return the slides of the metastatic tumor of the ciliary body, and also a slide from the brain of the same case. It seems likely that the tumor is a carcinoma, though the morphology of the brain metastases and those in the eye are not wholly characteristic. Of course, the fact that the patient had a malignant tumor of the breast is the most important evidence which can be brought forward in this regard.

"Dr. Hodenpyl thinks that it is undoubtedly carcinoma, though he says he would not make such a diagnosis unless he knew of the primary growth in the breast. A number of other men here in the laboratory have looked at the specimens and agree on the diagnosis of carcinoma."

The clinical features which seem to characterize this tumor are its dull gray color and flatness or extension laterally without sharp limitation, in which respects it differs from sarcoma. In appearance it resembled a solitary tubercle or a gumma. There was, however, no iritis and no vascularity. Pain was intense, tension normal.

The literature of metastatic carcinoma of the choroid is extensive. Between thirty and forty cases have been collected by Uhthoff, Oatman, and others. In two cases of Lagrange and Ewing, the area of the long ciliary vessels was involved, as well as the short or posterior ciliary, which in the thirty-one or thirty-two cases reported by Oatman and Lagrange were the avenue by which the metastasis reached the posterior pole of the eye. The extension of this tumor forward, around the iris, and even on Descemet's mem-

brane, is very characteristic of the flat shell-like growths seen in the posterior part of the eye.

Only two other cases of metastatic carcinoma, involving the ciliary body and iris alone, have been reported by Uhthoff (*Deutsch. med. Wochenschrift.*, Sept., 1904), and by Von Briehn (*Inaug. Dissert.*, Königsberg, 1903).

REPORT OF THE MEETING OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

THURSDAY, MAY 4, 1905. JOHN TWEEDY, P.R.C.S., PRESIDENT, IN THE CHAIR.

Dr. Leslie Buchanan (Glasgow) read notes of two interesting cases, which illustrated the **late effects of birth injury to the cornea,** and mentioned the fact that he had quite recently seen a third.

The first case was that of a girl, aged twelve, whose sight was very defective, being only $\frac{5}{60}$ in the right eye. At first it appeared that there was a corneal nebula, but on a more careful examination there were seen to be two peculiar lines at or near the posterior surface of the cornea. The term "refraction opacity" was used to convey an idea of the appearance of the lines. They had a double outline and appeared to present a different character according to the position of the observer. A high degree of mixed astigmatism was present.

These lines so closely resembled the lines of opacity seen by Buchanan and Thomson in cases of birth injury, that the history of this case was investigated and it was found that the facts corresponded with the histories of the other cases.

The second case was quite similar to the first, and it was the unusually high degree of astigmatism in one eye that was the means of drawing attention to the condition. The corneal scars were so faint, numerous though they were, that they were passed over at the first examination. Ophthalmometric measurements in both cases showed that the astigmatism was entirely corneal.

Dr. Buchanan emphasized the fact that these marks could easily

be missed, but the presence of a high degree of astigmatism in one eye only should give rise to suspicion and the back of the cornea should be investigated, as well as the history.

Dr. Leslie Buchanan showed a series of lantern slides illustrating the changes found histologically in cases of **lesion of the choroid.** Four cases were described in which choroidal changes were found in eyes that were excised for other reasons. The first was an ordinary case of disseminated choroiditis. In the second case, active changes were taking place in the pigment epithelium, which was proliferating. There were other changes associated with this in the choroid proper, of a kind frequently seen in cases of sympathetic ophthalmia. The third case had irregular pigmentation of the choroid, and sections showed that there was a fibro-cellular deposit on the surface of the retinal pigment epithelium. The last case showed black spots surrounded by a lighter areola. These changes were shown to be due to the accumulation of pigment granules in the epithelial cells.

The last part of the demonstration was concerned with the formation of the myopic conus, and it was shown that in certain cases there was more than a mere stretching of the choroid for a fibro-cellular formation was found in two cases on the surface of the elastic lamina. In one case it was highly vascular and in the other it was greatly degenerated.

Dr. A. H. H. Sinclair read a paper on **Bjerrum's method of testing the visual field,** especially as applied to the diagnosis of glaucoma. The apparatus consisted of an ordinary perimeter, and in addition a large screen made of some very black and lustreless substance, such as velvet. The surface was mapped out with black thread in concentric and radial lines, like an ordinary perimeter chart, so that tracings of one could be recorded on the other. The fixation object was usually placed at the centre of the field, while the test objects were made of white ivory of from 1 to 20*mm*, and were held in a clip at the end of a thin black rod which could be moved about in any direction.

This method had several advantages over the ordinary perimeter, for it could be used to investigate the condition of the field within its full limits, and often demonstrated minor or relative defects within the field, which are often of great clinical importance, and which the ordinary perimeter is unsuitable to demonstrate.

Lantern slides were shown exhibiting the condition of the field found in different groups of cases. Glaucoma fields were contrasted with fields taken from cases of optic atrophy. Several tracings were shown in which the glaucoma symptom was demonstrated with the screen but where the peripheral fields and vision were normal. A series of charts was shown which were obtained at intervals of from six weeks to five years, indicating the permanent nature of this symptom in many cases and how it might change in others. Other variations of the field in glaucoma in connection with this test were also shown and discussed.

Dr. ARTHUR L. BALLANTYNE described the microscopical condition of the left eye of a fœtus of seven or eight months old, where the pupillary membrane was almost complete, and adherent at one part to the posterior surface of the cornea. The iris was adherent to the cornea in the corresponding situation. The different layers of the cornea were normal, but at the place where the iris and pupillary membrane were adherent the endothelial lining of the anterior chamber was absent, though present elsewhere. The remains of the hyaloid artery and tunica vasculosa were also present.

The author attributed the adhesion to an inflammatory process which had led to the destruction of parts of the endothelium of the anterior chamber, and consequently to an intimate adhesion of the walls of the anterior chamber at the affected parts.

In discussing the literature he said he had found fourteen cases recorded, and two theories were held to account for it. The one was that the cleavage of the mesoblast into the substantia propria of the cornea is incomplete, hence the apparent adhesion of the fully developed membrane and cornea. The other theory was that the adhesion is set up by an inflammatory process between the iris or pupillary membrane and the cornea where these are naturally in contact during fœtal life, or subsequently during abolition of the anterior chamber either with or without perforation of the cornea.

The author considered that the second theory accounted for most of the cases, and there is a lack of direct evidence in favor of the first.

Mr. S. JOHNSON TAYLOR related a case of **pulsating exophthalmos** which was cured by ligaturing the common carotid. The patient, a woman aged fifty-five, was first seen four years ago,

suffering from pulsating exophthalmos on the right side and a well-marked intracranial bruit, audible to herself and also, with a stethoscope, to the observer. The bruit came on immediately after a fall seven weeks before in which she struck the left side of her head against a stone step; she was rendered unconscious for a few minutes, and at the same time she broke her collar-bone; the proptosis did not come on until four weeks later. She suffered severe pain with corneal ulceration, all of which became worse in spite of rest, iodide, etc. Mr. Johnson Taylor considered it advisable to ligature the right common carotid, and this he did at her own home about nine weeks after the injury. The result was a perfect and permanent cure and no untoward effects ever manifested themselves.

ABSTRACT OF THE TRANSACTIONS OF THE FORTY-FIRST ANNUAL MEETING OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY.

By Dr. J. N. REIK, Baltimore, Md.

BOSTON, MASS., MAY 11–12, 1905.

A case of flat melano-sarcoma of the choroid, with unusual clinical features. Dr. C. J. Kipp.

The cause of the disease was traumatism, the patient while splitting wood having been struck in the eye by a fragment. There were recurrent attacks of pain in the eye and extensive but circumscribed œdema of the ocular conjunctiva, without increase of tension, the attacks lasting from three to four days, and recurring about every four or five weeks. Between the attacks the eye gave no trouble. Ophthalmoscopic examination showed detachment of the retina peripherally with the tumor near the macula. The eye was enucleated a little less than a year after the first examination. There was detachment of the retina, except over the most prominent parts of the tumor. The tumor extended from the ciliary region to the optic disk, without involving either of these structures, above to the median line, below it crossed the median line somewhat—temporal half of the globe. The tumor was in most places only *2mm* in height ; in a few places it reached a height of 5 to *6mm.* The growth had perforated the sclerotic at several places and an epibulbar growth was found in the region of the posterior pole. Microscopically the growth did not differ materially from the flat sarcomata previously described.

Concerning melanoma of the choroid, with the report of two cases. Drs. Geo. E. de Schweinitz and E. A. Shumway.

The writers reviewed the literature of the subject and reported

the clinical history of two cases of melanoma of the choroid, giving the microscopic examination of the enucleated eyeballs, the relation of melanosis and pigment deposits in other portions of the eyeball to the development of sarcomas, and in particular this relationship as it existed in the specimens under consideration. One of the patients had sarcoma and the other endothelioma of the brain.

Metastatic carcinoma of the ciliary body. Dr. C. W. CUTLER.

The patient was aged thirty-three. Mother and one sister said to have died of cancer. The patient had a breast removed for cancer about a year before the present symptoms began. The middle of last August she began to have severe pain in the left eye; there were dizziness and vomiting, and numbness of right arm and leg. Early in September tumor of the iris appeared and increased rapidly in size. The media were clear, the fundus normal. The tumor was grayish, slightly elevated, and not sharply defined. The eye was removed because of intense pain, which was relieved; but the patient died a month later of carcinomatosis. Microscopic examination showed that the growth was confined to the ciliary body and iris and was carcinoma.[1]

Discussion.

Dr. TAYLOR (Wilkesbarre) mentioned briefly a similar case seen in his practice in which he thought at first that he had to deal with a case of hemorrhagic glaucoma. The patient had previously had a detachment of the retina. The eye was enucleated and examination showed the condition to be one of pigmented sarcoma of the choroid. She died about a year later of sarcoma of the liver.

Dr. SUTPHEN (Newark) reported a case in a woman of eighty-five whom he first saw with **detachment of the retina** at which time no tumor could be made out. About a year before, she had had a tumor of the breast removed. The detachment increased, iritis developed, and tension increased in that eye. On removal of the eye, a large tumor was found which the microscope showed to be a carcinoma. The disease involved all the tissues back to the optic nerve.

Dr. BULLER (Montreal) called the attention of the Society to the fact that twelve years ago he had presented a specimen of

[1] Published more fully and illustrated in this issue, p. 392.

a sarcoma of the choroid originating in the macula and of only about one half the size of that reported by Dr. Kipp in his paper. Dr. Noyes of New York had later shown him one about half the size of his which had been obtained in Heidelberg. He deprecated the fact that reports made by members of the Society were overlooked by other members in preparing their papers.

Dr. E. E. JACK (Boston) had reported a case of double melano-sarcoma secondary to cancer of the breast, about two years ago.

Dr. WEEKS (New York) said that sometimes it happens that we meet with a metastatic carcinoma of the choroid before the disease has developed in other parts of the body sufficiently to be recognized. He had removed an eye some time ago expecting to find a sarcoma and found that it resembled closely an adenoma. About three months later, a large gland appeared in the axilla, and it was found that a carcinoma primary in the lung had existed and the metastatic carcinoma of the choroid had developed before the symptoms were sufficient to call attention to the lung.

Dr. KIPP said he had reported the case not on account of the small size of the tumor, but because in spite of its anatomical size it had invaded and perforated the sclera.

Dr. DE SCHWEINITZ had reported the tumors not because of their small size, and had made reference to the literature of small sarcomata only as a matter of interest.

The Sachs lamp for transillumination of the eye. Dr. E. S. THOMSON.

The writer described the Sachs lamp and explained its use in transillumination of the eye for diagnostic purposes, especially in the diagnosis of intraocular tumors.

Improved surgical methods for the successful use of the electro-magnet. Dr. R. SATTLER.

Dr. Sattler spoke of the expediency of modifying present surgical methods, their technique, or both, for the successful removal of a foreign body from the interior of the eye, which could not be seen or discovered by the methods ordinarily resorted to, and the actual presence of which and its location with equal precision can alone be determined by the disclosures of X-ray photography. He considered this important achievement due in the main to the ingenious apparatus of Dr. Sweet. The presence and location of foreign bodies once determined and

confirmed by several radiographs taken at different angles, the question at issue becomes: (1) Shall we adopt the methods commonly resorted to, or (2) fortified with more accurate information furnished by Roentgen rays and Sweet's apparatus, resort to the direct exposure and exploration of the region nearest the foreign body for the application of the magnet? Illustrations of cases with the methods resorted to in each were given, with the suggestion that for certain cases of this class the method resorted to was safer and attended by less destruction or tearing of tissue.

Discussion.

Dr. HOLT (Portland, Me.) had been one of the first to report a series of cases where steel had been removed from the vitreous. Since the use of the more powerful magnets, he always entered the eye in the inferior temporal quadrant and never had any trouble in getting the foreign body. In nine of twelve cases first reported, he had been unable to locate the foreign body prior to operation. He agreed with the writer of the paper that it is safer to open the eye in the inferior temporal quadrant and introduce the small magnet than to undertake to pull it out with the larger magnet with considerable tearing of tissue.

Dr. LAMBERT (New York) substantiated what the writer of the paper had said, and briefly reported two cases which had recently come under his attention, in one of which the foreign body was located outside of the globe, and on enucleation of the eyeball it was demonstrated that the location had been absolutely accurate.

Dr. MARPLE (New York) was in favor of incising near the location of the foreign body and withdrawing it, where it had been definitely located. He thought it very desirable that all the cases where the foreign body is withdrawn through an opening in the sclera should be reported. As to whether the scleral opening tends to detachment of the retina or not, Hirschberg claims that it does not. If not, it is certainly the most desirable method,

Dr. SWEET (Philadelphia) thought the foreign body might be removed through the anterior chamber where the lens is injured, but that where it has passed through and lodged in the posterior part of the eye, and where the lens is clear, it should be removed by scleral incision.

Dr. RISLEY (Philadelphia) said that in his experience there

had not been an instance of detachment of the retina, and he still held to the view given in a paper previously read before the Society, that if the foreign body had been present long enough to have attached itself to the membranes of the eye, the retina or choroid, the probabilities of detachment of the retina if the powerful magnet is used are greater than if the foreign body is located, section made through the sclera, and the body withdrawn in that way.

Dr. FRIDENBERG (New York) thought the magnet open to objection as a means of diagnosis and that the foreign body should first be localized with the X-ray before placing the patient in front of the magnet.

Dr. WADSWORTH (Boston) had reported to the Society some years ago several cases of detachment following removal of the foreign bodies through a scleral incision with the small magnet; in one the detachment occurred at a point diametrically opposite the wound which the foreign body had made on entrance.

Dr. ZIEGLER (Philadelphia) said that as to detachment we make the same operation for detachment as for these removals of foreign bodies—that is, a posterior sclerotomy. Of course if the magnet causes a detachment in drawing the foreign body loose that is the fault of the magnet and not of the incision; it may happen just the same in the anterior portion of the eye. He had never seen detachment follow scleral incision.

Dr. THOMSON (Philadelphia) had in one case localized the foreign body below and removed it through the sclera and no detachment had followed after eighteen months. The lens remained clear and he could observe the interior of the eye clearly.

Dr. FISKE (Chicago) reported one case where there had been little hemorrhage and the body could be located with the ophthalmoscope. Incision was made in the posterior pole and the piece of steel removed easily, but four or five months subsequently detachment occurred and became complete.

Dr. DE SCHWEINITZ (Philadelphia) had recently gone over his cases of foreign bodies and compared those where the Haab magnet was used and those with Sweet's localization and removal, and found that his results were exactly the same, but he desired to go on record as believing, as Dr. Sweet had said, that the X-ray examination should precede the use of the magnet. He had

never seen a detachment following scleral incision where the foreign body had been drawn through the incision.

Dr. CALLAN (New York) said that with the scleral incision his results had been unsatisfactory. They had been much more satisfactory with the Haab method, and he was therefore a strong advocate of that method.

Dr. WEEKS (New York) had recently had a case where the body was in the vitreous. He succeeded in drawing it into the posterior chamber, where it impinged upon the iris and could not be drawn into the anterior chamber. He made an opening through the cornea and as soon as it was made the edge of the foreign body presented. The patient was then taken to the Haab magnet, but the body did not come away readily, and then to the astonishment of the operators it came away with almost the entire iris. He thought it would be advisable to always make an iridectomy in case the foreign body is in the posterior chamber and there is reason to believe it is entangled.

Dr. HOWE (Buffalo) thought it very important to take into consideration the time that had elapsed since the accident. On one occasion he had a case where the foreign body had been lodged in the eye for some time and it was found utterly impossible to remove. After enucleation he applied a magnet to the section of the eye containing the foreign body and pulled away the whole choroid. It was also important to consider how near we could get to the foreign body in applying the magnet. The small magnet might be just as powerful if introduced very near the body as the larger magnet applied at a distance.

The attractive power of the magnet upon steel alloyed with other metals. Dr. W. M. SWEET.

The writer referred to the increasing use of nickel, manganese, and other metals in steel-making; the employment of the alloyed steel in the manufacture of tools etc., for industrial operations; the effects of these alloys in decreasing the magnetic properties of the steel, and therefore rendering the extraction of splinters from the eye by the magnet less positive. He compared the magnetic properties of all the different metals, explained the different forms of steel in use and their response to magnetic influence.

Remarks on the use of the Roentgen rays in localizing foreign bodies in the eyeball and orbit. Dr. J. E. WEEKS.

Dr. WEEKS reviewed the use of the ophthalmoscope, the

magnet, and the sideroscope in localizing foreign bodies in the eyeball and orbit. He then spoke of the different methods of employing the X-rays, their relative merits, and the conditions that produce error and the manner of plotting the location of the foreign body, in which he employed a method that was a modification of Dr. Sweet's.

Dr. SWEET (Philadelphia) in discussing Dr. Weeks's paper considered in detail his method of plotting the location of foreign bodies, and called attention to the fact that he had recently devised a new apparatus which he had shown at a meeting in New York in February, in which the patient's head is supported by a rod which presses against the side of the head and also holds the plate. It gave less chance of movement of the head.

What are the so-called reflexes which can be properly referred to eye-strain? Dr. L. HOWE.

The author considered the criteria by which to judge whether or not a given symptom might properly be considered a reflex; reflexes from eye-strain manifested in the globe itself; in the accessory muscles of accommodation; in other portions of the body. He reviewed the testimony on this point furnished by others, and gave the gist of the replies received to 206 letters on the subject sent out to ophthalmologists, and commented upon the character of this evidence. The writer concluded that personal equation entered very largely into the reports; that the large experience of these observers shows beyond question that these different diseases and the symptoms mentioned can not honestly be ascribed to eye-strain; that an important cause of the differences is lack of definite terms for the symptoms of disease. We should have some definite criteria to judge by.

Discussion.

Dr. RANDALL (Philadelphia) said that while not prepared to bring forward any statistics, nor to make any very startling assertions, with regard to the reflex disturbances from eye-strain, he felt that if he knew anything in ophthalmology it was that he was absolutely convinced of the existence of various reflex diseases due to eye-strain. He had never seen epilepsy cured by the relief of eye-strain, but he had seen it mitigated, so much so that the patients practically ceased to have attacks. He hoped that

those who doubted the existence of these reflex conditions would consider the matter most carefully.

Dr. PYLE (Philadelphia) had found Dr. Howe's questions so difficult to answer that he thought his conclusions must be rather negative. He thought to come to any definite conclusion from the indifferent manner in which the replies had been given would not be wise. He thought it very difficult to draw a line between functional and organic disturbances; that functional trouble may result in organic change if long enough continued.

Dr. HOWE thought he had presented the questions as simply as it was possible to put them. He had simply taken a catalogue and asked for the answer, yes or no. He had been gratified and surprised that a slight majority did answer; out of 206, 105 replied, which he considered a pretty good percentage of replies to receive in sending out circulars. He thought what we needed was scientific investigation of the subject instead of simple dogmatic statements. He thought a larger number of men might look over their cases and assist in drawing definite conclusions on the subject.

Symptoms presented by the different bacteriological types of acute conjunctivitis. Dr. ALEXANDER DUANE.

Clinically, the writer said, we might distinguish three types: (1) palpebral, in which the lids principally are affected; (2) ocular, or the pink-eye form, in which the ocular conjunctiva is chiefly affected; and (3) the mixed form, in which symptoms of both types are present. He gave an analysis of 132 cases of acute conjunctivitis, in which a bacteriological examination had been made, with the idea of determining the prevailing types of bacterial infection in ordinary acute conjunctivitis and the distinctive clinical symptoms presented by these types. In the gonococcal form the palpebral symptoms generally predominate. The ocular type is considered rather characteristic of the Weeks bacillus. No positive inference may be drawn from the symptoms as to the kind of bacteria causing the trouble. The staphylococcus albus and aureus generally cause the corneal lesions.

Discussion.

Dr. WEEKS (New York) thought it always impossible to tell from the symptoms what organism was producing the trouble, that this could only be ascertained positively with the aid of the

microscope. He thought Dr. Duane's paper emphasized the importance of examining the secretions under the microscope, which was the only satisfactory way of determining the nature of the disease.

Relapsing iritis. Dr. HIRAM WOODS.

The paper consisted of a study of nine cases of recurrent iritis observed through periods of several years, with special reference to cause, original attack, constitutional dyscrasia, influence of synechia, eye involved, use of eyes and influence of ametropia, the course, mode of onset, behavior of pupil, presence or absence of exudates, presence or absence of ocular inflammation. Treatment: selection of mydriatic; constitutional remedies; iridectomy. In the main, the writer's conclusions confirm prevailing views. In three of the nine cases gonorrhœa played an important rôle. The author believed that gonorrhœal iritis would be oftener diagnosed if looked for; that because of the time elapsing between the urethritis and the iritis the gonorrhœa as a causative factor was overlooked and the iritis put down as rheumatic iritis. The gonorrhœal cases did not have recurrence of gonorrhœa, nor the rheumatic cases a return of the rheumatism. The rheumatic cases showed a large amount of exudate. The exudate seemed to depend more upon the intensity of the inflammation than upon the cause back of the iritis. He thought that unless there was evidence of rheumatism or gout generous diet was indicated. Diaphoresis was of considerable benefit. Euphthalmin was sometimes substituted for atropia with good results.

Discussion.

Dr. HANSELL (Philadelphia) thought that the terms "relapsing" and "recurrent" did not indicate exactly the same affection, since the former referred to that form of inflammation which in the intervals between the active and acute inflammation, though free from the external signs of inflammation, is still the seat of increased vascularity or in which the seeds of the disease still lurk, while the latter meant that the eye recovered perfectly from the first attack and during the interval before the next is really well. He referred to a case under treatment as illustrative of the former condition, being a case of so-called "quiet iritis." He gave as an example of "recurrent" iritis the case of a young man who for three successive summers had violent attacks of

acute iritis. In one the anterior chamber became filled with a web-like filmy membrane, and vision was reduced to the perception of light. In all three attacks synechiæ were formed which later were broken away. The cause of the second case was rheumatic or gouty diathesis, and was cured by vigorous treatment at home and abroad. He believed that the recurrence is due in the majority of instances to one of two conditions: imperfect recovery from the first attack, or the too early cessation of treatment, and the still active underlying cause of the first attack.

Dr. KIPP (Newark) said these are the cases in which we so frequently get atropin poisoning, so that often some other mydriatic had to be substituted. He had recently used atropin in olive oil, but without good results.

Dr. RISLEY (Philadelphia) called attention to the fact that in these cases generally the iris is not alone involved but the entire uveal tract, and the inflammation subsides slowly, and frequently returns, it may be many months before the uveal tract has assumed a condition that may be called healthy. He believed that often the relapses are brought about by use of the eye when in such weakened condition, as a result of the attack, that it would not permit of such use.

Dr. ZIEGLER (Philadelphia) thought he had in a great many of these cases been enabled to get them under control by attention to the nasal condition. He believed that such treatment had relieved a number of attacks.

Dr. WOODS had, in some cases, gotten excellent results by the substitution of 10 per cent. solution of euphthalmin for the atropia. He thought Dr. Risley's explanation of the cause of many of these recurrences as being due to use of the eyes when weakened by disease a very probable one.

Juvenile glaucoma. Dr. R. SATTLER.

The paper consisted of a clinical study of two cases occurring at the ages of eleven and seventeen, together with a brief review of the pertinent facts known of glaucoma occurring during the earlier or juvenile periods of life so far as clinical declaration, sex, and heredity were concerned. The first case was myopic; tension plus 2; double iridectomy was done. The second case was without any hereditary predisposition. Occurred during an acute attack of measles. Vision was totally lost in one eye and the other reduced to $\frac{1}{10}$. Operation produced cessation of attack.

Discussion.

Dr. POOLEY (New York) referred to the extreme rarity of juvenile glaucoma, and spoke of a case in a boy of thirteen in whom the cornea of one eye was smaller than that of the other; tension increased, but no pathological cupping of the disk; with fields limited for form and color in both eyes.

Dr. HARLAN (Baltimore) called attention to a case previously reported by him of a girl of seventeen whose mother was blind, and the blindness could be followed back for five generations. He had done a double iridectomy and had been able to follow the case since. A few years later she had about the same vision as when the operation was done. She had married and had seven children, and had retained the same vision up to the present time. He had seen another case in the past year in a girl of seventeen who appeared with interstitial keratitis. As it became worse, she had called attention to the fact that vision in the other eye was bad, and it was discovered that she had glaucoma.

Dr. SATTLER said that in the first case there had been no hereditary predisposition found though it had been thoroughly investigated. In the other case there was absolutely no family history of that kind.

Cyanosis retinæ. Dr. W. C. POSEY.

The author referred to the changes observed in the fundus in cases of congenital heart disease with general cyanosis, and to the value of the ophthalmoscopic examination in this class of cases, both from a diagnostic and prophylactic standpoint. He reported some cases, with exhibition of an illustration of the eye-ground and gave a *résumé* of other cases in the literature. He said that the first case had been presented by Dr. Knapp at Heidelberg. In the writer's case, the veins were enormously enlarged and distorted and became much darker in color. The peripheral twigs were also distended; pulsation of the vessels was absent. The attention of the Society had been first called to the subject by Dr. Knapp in 1870, since which time no other case had been brought before it. There were fifteen cases besides that reported by Knapp in the literature, to which the writer had added two others. He considered that the ophthalmoscope might often be of service to the clinician in those conditions where the physical signs of heart disease were lacking.

Acquired cyst of conjunctivæ containing an embryonic tooth-like structure. Dr. E. STIEREN.

Dr. STIEREN exhibited a specimen of a tooth-like structure which had been removed from a conjunctival cyst.

A case of cystic sarcoma of the orbit. Extirpation. Death. Dr. H. F. HANSELL.

The tumor had its origin in trauma. Boy of eighteen, who at five received a blow on the left side of the head. His family history was good, the only flaw being death of three maternal uncles from tuberculosis. He was mentally and physically undeveloped. A month later the eye bulged forward and gradually a tumor appeared behind the ball, the boy suffering more from inconvenience than from pain. It attained an enormous size, base 7*cm* in diameter covered by conjunctiva. Removed without accident, the tumor not being encapsuled except at the posterior extremity, and there was a pedicle which passed through the optic foramen. Convalescence was interrupted by erysipelas. Symptoms of meningitis developed and the boy died.

Discussion.

Dr. SATTLER (Cincinnati). A few years ago had a similar case, in which the beginning was attended by marked pulsation, which was even communicated to the eye. Increase was rapid and it soon assumed the proportions that Dr. Hansell's case did. We operated because of excessive hemorrhages that occurred and debilitated the boy. The tumor had to be removed with a thermocautery. The boy lived some weeks and was more comfortable.

Certain congenital affections of the eye coinciding with strong ante-natal impressions made on the mother. Dr. H. DERBY.

The author related that among 25,000 recorded cases there were 6 cases of coincidence of congenital affections of the eye, embracing various forms of congenital disease, which had been accredited to impressions made upon the mother during pregnancy.

Discussion.

Dr. KNAPP (New York) said that in nearly a hundred thousand recorded private patients he had never seen a case that would tend to strengthen this hypothesis.

Dr. HOLT (Portland, Me.) referred to a case that he had reported of a boy about twelve years old brought to him with no

eyes, and whose mother informed him that he was born without eyeballs. Inquiry elicited the information that when about three months pregnant workmen were digging a cellar and an older child was playing in the yard. The workmen not seeing the child threw a shovel of earth in its face. The mother seeing this was very much frightened and attributed the child's birth without eyes to that cause.

Dr. PYLE (Philadelphia) had recently had occasion to examine the records of maternal impressions recorded from the time of Hippocrates down, and had failed to find any scientific evidence whatever to confirm these ideas.

Dr. HOWE (Buffalo) thought a point worth mentioning was the negative evidence which is obtained by examining pupils in the blind asylum, where we are apt to find a repetition of the changes in two or more of the same family. If due to maternal impressions, the mother must have had the same impression before the birth of each child.

Lesions of the fundus of the eye due to ptomain poisoning. Dr. C. S. BULL.

The writer referred to lesions of the fundus as one of the rarest complications of auto-intoxication. Well-marked exudative choroiditis, involving the retina secondarily, the patches of exudation being large, flat, oval in shape, and at first free from any pigmentary deposit, were found. The subject was illustrated by three cases, in which the vision was at first seriously affected, but was finally restored to the normal standard, all three cases being accompanied by a marked general eruption of pemphigus. The first case was supposed to have been caused by tainted meat in the form of croquettes. She complained of indistinct vision; cornea was clear; pupils dilated and immovable; media clear; optic nerves pale; patches of yellowish white in the choroid. Iron, strychnia, and arsenic cleared up these patches and the paralysis of accommodation disappeared. The second case was attributed to poisoning with impure fish, two months before patient was seen by the writer. Vision much impaired; equal to $\frac{1}{10}$; with complete paralysis of accommodation. Cornea clear, but some striæ in both lenses. Patches of choroiditis varying in size and shape and with no pigmentary ring.

The treatment of inoperable cases of malignant diseases of the orbit by the X-ray method. Dr. C. S. BULL.

The author thought that the advantages claimed for the X-ray

method of treatment were overestimated. He said that in estimating results we must distinguish between carcinomatosis and sarcomatous growths, it being an established fact that the X-rays do exert a much more favorable effect on the former than on the latter. That up to the present time we had not been able to measure with any accuracy the activity of the radial energy coming from the tube, and hence could not determine the dosage. Pain was always relieved by the X-ray treatment, and the more recent and superficial the malignant growth, the more rapid and favorable were the results of treatment. By way of illustration the writer reported ten cases.

Discussion.

Dr. THEOBALD (Baltimore) had had very little experience with the X-ray, but one case had recently occurred which he thought worth mentioning: young negro man, twenty to twenty-five years of age, with marked exophthalmos, not suffering pain, limitations of movements of the eye, neuro-retinitis, with engorgement of veins, etc. Diagnosis of orbital growth was made and skiagraphs confirmed that diagnosis, showing that the growth was invading the orbit from the apex. Dr. Cushing, of the Hopkins, examined it and agreed that it was sarcoma and advised against operation. The X-ray was used and the case is still under treatment. The result of several weeks' treatment had been that the exophthalmos completely disappeared and the man's condition greatly improved, so that he has gained seventeen or eighteen pounds in weight.

Dr. MARPLE (New York) had seen a patient last winter who had a retrobulbar papilloma removed five or six years before and who then had an epithelioma. The patient had been under Dr. Dixon's treatment with the X-ray with decided improvement. After several applications, the cornea looked very much like xerosis. It seemed as though perhaps the use of the cocaine had caused this condition. The growth had materially lessened.

Dr. CLAIBORNE (New York) seven or eight years ago had seen in consultation a patient with epithelioma of the right eye, affecting both lids. It was decided to remove the eye. The orbit was scraped out thoroughly and a plastic operation done. About eight months ago she returned with a few epitheliomatous patches about the nose running towards the good eye. She

was sent to the Skin and Cancer Hospital and the X-rays were used, with the result that the patches disappeared.

He thought that in superficial growths the X-ray was preferable to the knife.

Dr. JACK (Boston) said that the surgeons in the Massachusetts General Hospital thought that sarcomatous growths might be made worse by the X-ray. He thought in these cases the X-ray was not indicated.

Dr. WADSWORTH (Boston) had seen a few cases of superficial epithelioma benefited by the X-ray, but personally had no knowledge of any complete cure and continued immunity. He thought that where the case was operable the knife was better than the X-ray.

Dr. ROY (Atlanta) thought that an important point was that the improvement in these cases occurred where there had been no cutting whatever. The results were better where there had been no operative interference. Where operation had been done and then the X-ray applied there was no improvement.

Dr. WOODS (Baltimore) referred to a case of sarcoma of the conjunctiva occurring in his practice, the growth involving the inner canthus and spreading toward the inner limbus. After the diagnosis, exenteration of the orbit was urged. After the excision of all the cancerous tissue, the X-ray treatment was instituted at once and kept up for two months. About a year later, a letter was received from the patient's physician stating that a nodule had reappeared on the edge of the lid and been excised. Since that the patient has been entirely free. He thought that after removal of the growth in operable cases the prognosis was better if the X-ray treatment was instituted at once.

Dr. DUANE (New York) said that in cases of carcinoma of the breast the general treatment advised now was to continue the X-ray applications after excision.

Dr. BULL said the two cases which were cured were operated upon, and the X-ray treatment subsequently instituted. His object in presenting the paper to the Society had been to emphasize as much as possible what are, or what should be, absolutely inoperable cases by the knife, and to call attention to the absolutely unsatisfactory reports of the majority of these cases of so-called X-ray treatment in malignant disease.

Vernal conjunctivitis in the negro. Dr. DUNBAR ROY.

The author considered that cases differ very much according to location and environment. His paper was based on ten cases, the youngest three and the eldest twenty-five, all of bulbar form. There was no difference in the sexes. Attended by gritty sensations, but by no marked discomfort; congestion of bulbar conjunctiva; the palpebral change was only that of congestion. Waxy hyperplasia around the cornea and extending over it for a considerable distance. The disease appeared with warm weather and subsided with cold. They were distinct from phlyctenular forms. He gave the histological findings from particles excised in detail.

Discussion.

Dr. PYLE (Philadelphia), in his earlier career in Washington, had been impressed with the immunity of the negro from glaucoma and the frequency with which he had vernal catarrh. He agreed with Dr. Roy that the disease was quite characteristic in the negro; that on account of the negro's white sclera and black iris the appearance was very marked; that the disease disappeared without treatment, other than palliative treatment. He thought that Dr. Burnett, of Washington, had proven conclusively that vernal conjunctivitis does occur in the negro.

Dr. HARLAN (Baltimore) concurred with the author and previous speaker, and considered the disease comparatively common in the negro in Baltimore.

Dr. GRUENING (New York) thought that the microscopic examinations in these cases had been very thoroughly reported, and that there was an unanimity of opinion now that the condition was due to an increase in the elastic tissue of the conjunctiva. He thought that in the cases of vernal catarrh he saw in New York the lesion was more frequently in the upper lid than in the circumcorneal region. He referred to the mushroom-like elevations, which when removed by the knife occurred again in about a week, and which disappeared towards autumn. He spoke of the use of poliantine brought out by Dunbar, of Hamburg, for hay-fever, and said that he had seen benefit in vernal catarrh follow its use.

Dr. POSEY (Philadelphia) was rather surprised that Dr. Roy did not find the elevations on the palpebral conjunctiva in his cases, as in his own observations he had found a characteristic whitish thickening of the conjunctiva in 70 % of the cases. He

had never seen the hard, gristly granulations that Dr. Gruening referred to in the negro. He had recently tried the X-ray treatment in cases of vernal catarrh, Dr. Bennett having claimed good results from its application. It was toward the end of summer, however, and whether the diminution of the granulations was due to that or to the treatment he could not say.

Dr. THEOBALD (Baltimore) added his testimony to that of Dr. Roy and Dr. Posey as to the absence of palpebral changes. He had never seen a case of typical palpebral catarrh in the negro. He thought that many of the cases were not easily differentiated from phlyctenular conjunctivitis. He had used with good results in the treatment of the condition a solution of bichloride with sodium chloride, a $\frac{1}{60}$ of a grain of bichloride and 3 grains sodium chloride to the ounce.

Value of the co-called high-frequency current in certain ocular conditions, with illustrative cases (preliminary report). Dr. J. C. LESTER.

The writer reported a number of cases of improvement with the use of the high-frequency current in various conditions of opacities, retinal hemorrhages, and paralysis of the third and sixth nerves.

Discussion.

Dr. GRUENING (New York) was not convinced of the value of this form of treatment. Cases of ophthalmoplegia recovered with or without treatment in many instances; cases of vitreous opacities cleared up also, and vision returned. He therefore did not think the recited cases convincing.

Tumors of the conjunctiva and cornea. Dr. J. N. RAY.

The writer gave a detailed description of the ophthalmological findings in two cases of tumor of the conjunctiva and cornea. Both cases occurred in the male, late in life. Both were papillomatous in character.

A case of discoloration of the cornea by blood pigment, and one of hemorrhage into the cornea. Dr. O. F. WADSWORTH.

There had been hemorrhage into the anterior chamber first. A boy of twelve was struck in the right eye with a stick. The next day there was prolapse of the iris, with some blood in the anterior chamber. Several days later, the anterior chamber filled with blood. A month later there was considerable con-

gestion, and it looked as though the lens were in the anterior chamber, and there was doubt as to whether the opacity was in the cornea. Four days later, the cornea was darker and slightly greenish. After enucleation the cornea showed two opaque stars, and between them an oval area stained yellowish brown. The second patient, while lifting a heavy weight, noticed a bright red color in one eye. A few days later, hemorrhage in the cornea was evident. Microscopic examination in this case showed that the central portion of the cornea contained areas of hemorrhage.

A case of homonymous, left-sided, inferior tetratanopsia following toxic dose of salicylate of soda. Dr. J. H. CLAIBORNE.

In the left eye there was absolute scotoma of triangular shape; vision from the base of the triangle out to the periphery. Fields for red showed contraction on the nasal side. Form scotoma was smaller than color scotoma. In this case, champagne sprees were a contributory cause. The writer reviewed the literature on quinine and salicylate poisoning.

A case of epithelial corneal cyst, with microscopic and macroscopic specimens. Dr. J. H. CLAIBORNE.

Boy was struck in the eye with jackstone, causing an epithelial corneal cyst, of which the writer gave a detailed pathological description.

Photophobia.

Dr. P. FRIDENBERG considered photophobia as a term loosely applied to two different conditions, the fear of light entering the eye, the dazzling often amounting to real pain when the unprepared eye is exposed to bright light, and the intense pain associated with blepharospasm and lachrimation in superficial affections or injuries of the cornea, which is called photophobia, but is not fear of light, but fear of, and attempt to escape from, all external agencies—light, air, contact with foreign bodies, etc.

Test types in geometrical progression. Dr. JOHN GREEN.

This paper consisted in a report to the Society by its committee, of which Dr. Green was chairman, appointed for the purpose of considering the question of test types.

A new test-type case. Dr. C. H. WILLIAMS.

Dr. WILLIAMS demonstrated an arrangement for illuminating a card of test letters and changing the series by a system of pulleys from across the room. The letters followed Dr. Green's ar-

rangement of geometrical progression. He considered that the difference in the size of letters set forth in Dennett's chart to be rather exaggerated. On one side, in red letters, is the number of metres at which the letters should be read, and on the other the decimal equivalents are given.

Some changes in the construction of eye instruments which have not been in the direction of improvement. Dr. SAMUEL THEOBALD.

Dr. THEOBALD exhibited some instruments left him by his grandfather, the late Prof. Nathan R. Smith. He deprecated the modern tendency of making the shaft of the instruments unnecessarily long, showing a modern canaliculus knife, illustrating this defect, the blade being less than 50 % of the whole length. He also showed an iridectomy knife, referring to the advantages of the rather obtuse angle over the knives of present days with the angle more approaching that of a right one. He thought that a great many of the cataract needles had too long a shaft also. He showed also a Leiter ear-mirror which he had used for thirty years in contrast to one gotten within the last two months, showing how much better the first one was made.

In the closing exercises of the Society, the death of Dr. RUSSELL MURDOCH, of Baltimore, one of the oldest members of the Society, was referred to, and a committee appointed to prepare a suitable memorial for the next meeting.

The Society adjourned.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE SECOND QUARTER OF THE YEAR 1904.

By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the Assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and Others.

Translated by Dr. PERCY FRIDENBERG, New York.

Sections I.–III. Reviewed by PROF. C. HORSTMANN, Berlin.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

112 *a*. Saemisch, Th. **The diseases of the conjunctiva, cornea, and sclera.** Graefe-Saemisch, *Handbook of Ophthalmology*, second, revised, edition, Nos. 77 to 80, part ii., vol. v., section 1, chap. iv.

112 *b*. Lagrange and Valude. **Encyclopédie française d'ophtalmologie.** *French Encyclopedia of Ophthalmology*, vol. iii. Geometric, physical, and physiological optics and refraction. Paris, Ovin, 1904.

113. Truc, H., and Chavernac, P. **Hygiene of the eyes in the public schools at Montpellier.** *Rev. général d'opht.*, xxiii., p. 193.

114. De Wecker, L. **The reverse of a medal awarded to jequirital and its serum.** *Ann. d'ocul.*, cxxxi., p. 456.

115. Hirschberg, J., and Lippert, J. **Ali ibn Isa.** *Memorial for Oculists*, Leipzic, 1904, Veit & Co.

116. Hirschberg, J. **The instruments of Arabian oculists.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 161.

117. Nathanson, A. W. **Principles of estimating the capacity of the eyes.** *Wjest. Ophth.*, 1904, No. 2.

118. Gottschlich, F., Reichenbach, and Wolpert, H. **Methods of measuring daylight in schools.** Reprint from the *Klin. Jahrbuch*, vol. xii., 1904.

119. Scher, S. B. **Interesting skiascopic case.** *Wojenno Med. Jour.*, June, 1904.

120. Fisch, M. M. **The eye infirmary and trachoma in Sterlitamask.** *Westn. Ophthalm.*, 1904, No. 4.

121. Kraus, S. **Report of the ophthalmological section of the first pauper institute in Baku.** *Westn. Ophthalm.*, No. 4, 1904.

122. Kwiatkawskaia, J. A. **Report of the private ophthalmological institute.** *Westn. Ophthalm.*, No. 2, 1904.

SAEMISCH'S work (112 *a*) contains a complete dissertation on the diseases of the conjunctiva. In the four parts issued he considers hyperæmia and the inflammations, which he divides into catarrhal, or simple blennorrhœic, croupous, phlyctænulous, follicular, granular, and diphtheritic conjunctivitis.

The French Handbook of Ophthalmology, edited by LAGRANGE and VALUDE (112 *b*), is a system like that of Graefe-Saemisch. The present volume treats of physiological optics and refraction.

Geometrical optics (reflection and refraction of light, lenses, monochromatic operation) is treated of by André Broca. Ophthalmometry and the determination of the radius of curvature is the work of Sulzer in Paris, and contains a complete historical presentation of the subject. Tscherning discusses the dioptrics of the eye. The chapters on surgical operations and theory of accommodation are particularly noteworthy. This is followed by the discussion of focal ametropia and astigmatism by Sulzer, who also discusses the qualitative and quantitative determination of the retinal functions. In spite of his blindness, Javal has been able to contribute a valuable chapter on the practical application of eyeglasses. The following divisions have as subjects a determination of refraction, photoptometry and ophthalmotropometry, by Sulzer. Physiological optics and physical optics are discussed by A. Broca. The final chapter on presbyopia is by Sulzer.

HIRSCHBERG (115) mentions a work by the Arabian physician, Halifa B. Abi'l Mahassin, written about 1256, and containing thirty-six illustrations of Arabian oculist instruments.

SCHER (119) calls attention to the necessity of complete atropinization even in myopes for the skiascopic determination of refraction in military service. He reports a case in which the mydriatic had to be used for several days in the case of a subject suspected of simulation before the spasm of accommodation was overcome; and the myopia, at first apparently amounting to 6 D, was eventually determined as 2 D.

FISCH (120) treated from January, 1900, to July, 1903, 8680

patients. There were 1237 operations, including 152 cataract extractions, 671 entropium operations; 365 were incurably blind.

Between 1899 and 1903 KRAUS (121) treated 15,850 eye cases, among which there was 30 % of trachomas.

KWIATKOWSKAIA (122) treated 12,501 patients with 10,925 affections: trachoma 19 %, 99 in-patients, 677 operations, of which 288 were cataract extractions and 123 operations for trichiasis, 100 incurable blind (0.8 %).

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPY.

123. Hess, C. **Tuberculosis of the eye.** *Handbook of the Therapy of Chronic Pulmonary Tuberculosis*, edited by G. Schröder and F. Blumenfeld. Leipsic, J. A. Barth, 1904.

124. De Lapersonne. **The ocular neuroparalytic syndrome.** *L'ophtalmologie provinciale*, 1904, No. 3.

125. Villard, H. **Experimental and histological researches concerning sulphuric-acid burns of the eye.** *Arch. d'ophtalm.*, xxiv., 6, p. 363.

126. Cantonnet, A. **Variations of the volume of the healthy eye under the influence of the changes in the molecular concentration of the blood.** *Arch. d'ophtalm.*, xxiv., 4, p. 193.

127. Albrand, Walter. **Notes concerning post-mortem changes of the human eye.** *Arch. f. Augenheilk.*, l., p. 145.

128. Mettey, Ed. **Experimental researches on ocular phototraumatism caused by the electric light.** *Arch. d'ophtalm.*, xxiv., 4, p. 207.

129. Stärkle, Arnold. **Concerning the injurious effect of modern light sources upon the eye and its prevention.** *Arch. f. Augenheilk.*, l., p. 121.

130. Birch-Hirschfeld, A. **The effect of ultraviolet rays upon the eye.** *v. Graefe's Arch. f. Ophth.*, lviii., p. 469.

131. Bruns, Otto. **Experimental causation of phlyctenular inflammations by dead cultures of tubercle bacilli.** *Graefe's Arch.*, lviii., p. 439.

132. Herford, E. **Concerning artificial inflammations of the eye.** Collection of dissertations on ophthalmological subjects. *A. Vossius*, vi., No. 1.

133. Gelpke, Th. **Relations of the eye to juvenile dementia.** *Vossius's Abhandl.*, vi., vol. i.

134. Schmeichler, L. **Simulation of eye affections.** *Wiener med. Wochenschr.*, 1904, Nos. 16 to 23.

135. Galezowski. **The importance of diagnosis in eye affections.** *Rec. d'ophtalm.*, xxvi., p. 257.

136. Bartels, M. **Concerning the method of the examination of the pupils with incandescent gaslight.** *Zeitschr. f. Augenheilk.*, xi., p. 445.

137. Holth, S. **New method to determine the refraction of the eye.** *Ann. d'ocul.*, cxxxi., p. 418.

138. Wolff, H. **The theory of skiascopy and my electric skiascop-opthalmometer.** *Arch. d'ophtalm.*, xxiv., 4, p. 21 etc.

139. Frank, Otto. **Further experiences in the treatment of perforating infected injuries of the globe by large mercury doses.** *Beitr. z. Augenheilk.*, Heft 60, p. 1.

140. Senn. **My experiences with subconjunctival therapy.** *Arch. f. Augenheilk.*, l., p. 232.

141. Alexander, I. **Subconjunctival salt injections and injury to the eye after their application.** *Arch. f. Augenheilk.*, xlix., No. 307.

142. Stein, A. E. **Paraffin injections.** *Theorie und Praxis*, Stuttgart, F. Enke, 1904.

143. Schibkow, A. **Occurrence of complications in the application of local anæsthesia** (after Schleich) **in ophthalmic surgery.** *Katansk. Med. Jour.*, 1904, March.

144. Oliver, C. A. **A case illustrating the insufficiency of the present methods for recognizing distant color signals, together with a number of short suggestions for its removal.** *Ann. of Ophthal.*, 1904, April.

145. Milliken, B. L. **An unusual accident to a glass eye.** *Ophthal. Record*, 1904, April.

146. Risley, S. D. **A case illustrating the danger in extracting the fragments of metal from the vitreous chamber by a powerful magnet.** *Amer. Jour. of Ophthal.*, May, 1904.

Hess (123) discusses *in extenso* the tuberculous affections of the eye, beginning with parenchymatous keratitis, which, although caused in a majority of cases by congenital syphilis, often rests upon a tuberculous basis. Tuberculous ulcers of the cornea were observed in a number of cases, requiring curettage or cauterization, and not infrequently accompanied by deep inflammations, especially iritis and cyclitis. Cases of so-called benign tuberculosis are described which were characterized, aside from the deposits, by fine changes in the corneal endothelium. Most cases of scleral tuberculosis are produced by contiguity. According to Michel, scleritis is mainly, and iritis not seldom, of syphilitic or tuberculous origin. The etiology is often in doubt, and tuberculine injections may be of diagnostic value. It has been proven that undoubted tuberculous iritis with typical nodules may go on to spontaneous cure. Tuberculosis of the choroid may appear as a miliary form in general miliary tuberculosis, or as a chronic tuberculous inflammation. It may spread to the retina or sclera, and lead to perforation of the globe or metastatic tuberculous panophthalmia. The ophthalmoscopic picture of an ordinary disseminate choroiditis may be simulated by tuberculous affections of the choroid. The optic nerve may be

affected by tuberculosis at any point from the chiasm to the disk. Tuberculosis of the conjunctiva has been observed, but not frequently.

A relation of eczematous or scrofulous (phlyctenular) conjunctivitis to tuberculosis has been denied by a number of authors. Chalazion is generally not tuberculous. Tuberculous affections of the lachrymal sac and passages are comparatively rare. The affection may originate in the nasal mucosa. In regard to tuberculous affections of the lachrymal gland very little is known. A mild course is generally mentioned as a characteristic.

VILLARD (125) reports the result of experimental sulphuric-acid burns in rabbits' eyes. He distinguishes a first stage of chemical fixation, lasting twenty-four to thirty-six hours, which is characterized by immediate mortification of the cornea and of the epithelium, gradual disappearance of the fixed cells, and a marked swelling of the entire tissue. In the second stage, lasting two to seven days, there is an active immigration of leucocytes into the entire anterior section of the globe, fibrinous exudation in the anterior chamber, chronic hypopyon, and marked blenorrhœa. The last two stages mark the ulcerative destruction of the cornea, with invariable perforation and cicatrization. The conjunctival epithelium proliferates from the margin, and covers the degenerated surface of the cornea as well as the pus masses at the site of perforation. Epithelial defects are frequent, and often lead to cicatricial adhesions of the conjunctiva of lids and globe. The perforation may be closed by iris tissue, or by one or both lids, which may be coalescent at their margin.

CANTONNET (126) investigated the effect of various degrees of serum concentration on the intraocular tension, by means of subcutaneous or intravenous injections of solutions of salt, sugar, or magnesium sulphate in rabbits after artificially producing glaucoma in one eye. The injections were made before and after ligation of the renal vessels. The tonometric measurements were made at intervals of half to one hour for three to five hours. At first there was a diminution of intraocular pressure, and after several oscillations the original tension was found. Ligation of the renal vessels lowers pressure.

According to ALBRANDT (127), the capillary blush of the optic disk changes to a paper-white pallor very soon after death,

and the calibre of the arteries diminishes rapidly, while the veins remain visible somewhat longer. Post-mortem opacity of the retina begins in the neighborhood of the disk and the posterior pole, not infrequently accompanied by a blood-red discoloration at the macula, which becomes less marked as the retinal clouding increases. The first opacity in the media is seen on the surface of the cornea as a delicate gray stippling. As the intraocular pressure sinks post mortem, the pupil may by pressure upon the globe be distorted in any direction. The lens is generally found unchanged six to eight hours after death, but occasionally small dotted and striated cortical opacities were noted. Bluish-black spots in the conjunctiva (ecchymoses?) are frequent.

METTEV (128) exposed one eye of dogs and rabbits to the electric arc-light for from fifty to ninety minutes; the other eye served for comparison. The retina, treated according to Nissl and Bethe, showed no changes either in the layer of rods and cones, nor in the ganglion cells and pigment, but the optic nerve stained by Marchi's method showed disintegration of the myelin, extending as far as the chiasm, where the eye had been exposed to light for a long time.

STÄRKLE (129) considers a light source deleterious to the eye in direct proportion to its richness in rays of short wave lengths. In this respect petroleum represents the smallest amount of these rays, which may be decidedly reduced by dark chimneys or by colored glass. Of these, yellow-gray, red, and green glasses are the best, as they greatly reduce the short wave lengths without markedly affecting the intensity of illumination.

According to BIRCH-HIRSCHFELD (130), removal of the lens increases the range of perception of ultraviolet rays, although there are normal eyes which are scarcely, if at all, inferior to aphakial eyes in regard to the recognition of ultraviolet rays of low intensity. After dazzling with ultraviolet light, marked loss of chromatin and vacuolization of the ganglion cells and nuclear layers were noted in aphakial eyes; in others there were no retinal changes. The symptoms of snow-blindness or of dazzling by electric light, lightning, or sunlight seem to be identical with those of dazzling with ultraviolet rays. Erythropsia, ensuing upon dazzling, is dependent mainly on violet light. The formation of cataract by pure action of light has not been proved. To protect the eyes against these rays, smoked, gray glasses are used. Blue glasses are of very little use.

By injections of sterilized tubercle bacilli into the cornea of rabbits, BRUNS (131) was not able to produce a clinical picture at all resembling phlyctenular keratitis, although a condition resulted which differed only in degree from ordinary tuberculosis. Systemic injections, however, produced manifestations which had more or less resemblance clinically and anatomically to phlyctenular conjunctivitis of human beings.

HERFORD (132) describes in detail the various artificial inflammations of the eye, which are observed at all ages and in all classes. A large percentage is found in accident cases and in attempts to escape military service. The cause may be of a mechanical, chemical, or thermic nature. Unilateral involvement is generally characteristic of self-inflicted injuries of the eye.

GELPKE (133) found among 385 backward children 419 defective eyes. Of these 95 were myopic eyes, 20 were also astigmatic, 102 were hypermetropic, 105 eyes were simply amblyopic.

SCHMEICHLER (134) gives a detailed account of simulation in eye diseases. For its detection there is required not only the specialist's training, but practical experience and sufficient routine in the various methods for the detection of such simulations.

HOLTH (137), who has devised a method of determining ametropia by the apparent motion of double images, describes the same under the name of "Skiakinescopy" as a modification of Helmholtz's method of subjective skiascopy. The method is carried out as follows:

If a central light source be observed through a stenopæic slit, before which a needle is moved upward or downward, a myope sees the shadow of the dispersion circle moving in the same direction as the needle; in hypermetropia the shadow moves in the opposite direction. In astigmatism the motion of the shadow is parallel with that of the needle only when the latter is in one of the principal axes of the eye. If the correcting lens be placed before the eye, the shadow disappears. Holth claims that it is possible to correct refraction errors with unusual exactness by means of his skiakinescope.

WOLFF (138) disputes the assumption that the shadow boundary in the skiascope is always parallel to one of the principal meridians, and shows that only by the use of his electric skiascopophthalmometer the source of error of torsion of the shadow can be avoided, and accurate results obtained.

FRANK (139) reports 37 infected injuries of the eye which were treated in the Greifswald Eye Clinic during the last three years with mercury. Of these, 2 were serous uveitis, 20 fibrinous uveitis, and 15 purulent uveitis. The mercury was invariably applied in the form of inunctions together with intragluteal injections of mercuric iodide. Of the serous cases 1 was completely healed and 1 improved. Of the twenty cases of fibrinous uveitis, 14 were preserved with more or less lesion, and of 6, which were lost, three were enucleated; 2 were resected. Of the 15 purulent cases, 6 eyes were preserved with more or less sight, while abscesses of the vitreous developed in 9. The introduction of iodine bougies into the globe was not accompanied by success.

SENN (140) treated 330 patients (463 eyes) with subconjunctival injections of cyanide of mercury. The results were satisfactory. The cases included corneal herpes and ulcer, traumatic keratitis, retinal hemorrhages, central choroiditis in myopia, disseminated choroiditis, retinal choroiditis, retinitis pigmentosa, detachment, scleritis, parenchymatous keratitis, serpent ulcer, traumatic iridocyclitis, post-operative infections, and vitreous opacities.

ALEXANDER (141) reports three cases in which subconjunctival injections of 5 to 10 per cent. salt solutions resulted not only in adhesions between the bulbar conjunctiva and sclera, but in partial gangrene of the conjunctiva and temporary corneal changes as well.

STEIN (142) considers the various applications of paraffin injection in ophthalmology. They have been used after enucleation to give a better support to the artificial eye. Domec uses paraffin to make a model for the manufacture of artificial eyes. Hertel investigated the subject of paraffin protheses experimentally in rabbits, and advises the introduction of globes of paraffin into the orbit. Brockaert injected paraffin under the skin of the nose in a case of epicanthus with flat bridge with good results, and Klingelhöfer used the same method in a case of caries of the orbital margin to raise the markedly sunken nose. Topolanski found the method of service in ectropion and entropion as well as in cicatricial deformities of the lids, and partial trichiasis.

Cohn injects hard paraffin through the lachrymal canal in order to facilitate extirpation of the sac.

SCHIBKOW (143) used the Schleich injections for two entropion operations in women, and observed in one case a typical hys-

terical attack and in the other a profound and alarming anæmia. In both cases the operations had to be carried out under chloroform. He does not hold Schleich's method responsible in either case, but considers a hysterical predisposition responsible in one case and a morbid fear of death, which was afterwards confirmed, in the other.

OLIVER'S (144) patient occupied a position which required accurate recognition of signal lights, which he was found unable to distinguish under certain circumstances. Although he was able to pass the usual color tests, defective color perception was noted, when the unfavorable circumstances, such as cloudy weather and distance of the lights, were increased. For practical tests this author insists on the importance of examination under actual service conditions, particularly in regard to bad weather and the distance of the signals.

MILLIKEN (145) reports the bursting of an artificial eye while the patient wearing it was ironing in a warm room.

A foreign body of steel had been lying within the eyeball for two weeks in the case reported by RISLEY (146) and had produced marked inflammatory reaction. During the manipulations with the Haab magnet the splinter was forcibly drawn through the iris and through the old corneal wound. The eye afterwards became free from pain, congestion, and tenderness. Sympathetic irritation which had appeared in the other eye was also relieved. It might be questioned whether the author could reasonably expect better results from any other mode of extraction.

ALLING.

III.—INSTRUMENTS AND REMEDIES.

147. Sommer. **On oily collyria.** *Wochenschr. f. Ther. u. Hyg. d. Auges*, 1904, p. 217.

148. De Lapersonne, F. **Stovaine, a new local anæsthetic.** *Presse méd.*, 1904, No. 30, p. 233.

149. Mironescu, Th. **Pharmaco-dynamic studies on euphthalmin.** *Inaug. Dissert.*, Berlin, 1904.

150. Schanz, F. **Prescription and preparation of yellow oxide ointment.** *Zeitschr. f. Augenheilk.*, xi., No. 6.

151. Qurin, A. **Sounds with medicated tips.** *Klin. Monatsbl. f. Augenheilk.*, xlii., i., p. 553.

152. Pergens, Ed. **Grinding methods and calibre of spectacle glasses.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 560.

153. Hirschberg, J. **A new giant magnet.** *Centralbl. f. prakt. Augenheilk.*, xxvii., p. 176.

154. Lange, O. **A contribution to the solution of the school-slate question.** *Zeitschr. f. Schulgesundheitspflege*, 1904.

155. Becker, F. **A new sterilizable eye-dropper.** *Münchener med. Wochenschr.*, 1904, No. 24.

156. Black, N. M. **An illuminated test cabinet.** *Ophthalm. Record*, April, 1904,

157. Polignani. **Photoscopic apparatus for Krugel's experiment to detect simulation of amblyopia and monocular amaurosis.** Naples, 1904.

Stovaine, which was first recommended as a local anæsthetic in ophthalmology by DE LAPERSONNE (148), was synthetically produced by Fourneau from the group of amido-alcohols; it is the hydrochlorate of amylein $\alpha\beta$. Clinical experiments showed that it is of less tonicity than cocaine. Three drops of a 4 per cent. solution, instilled into the conjunctival sac of a rabbit, produced lachrymation, hyperæmia, and slight myosis, followed by anæsthesia of the conjunctiva and membrana nictitans within a minute, lasting for three to ten minutes. Three instillations at one-minute intervals produced total anæsthesia of the cornea, lasting twenty to twenty-five minutes, and also caused some desquamation of the superficial epithelium. D.'s assistant, Mettey, investigated the local action of stovaine on his own eyes. Instillations produced first burning and the sensation of a foreign body, lachrymation, and photophobia with conjunctival injection. One drop produced only partial anæsthesia, which became complete after three drops had been instilled. Besides this temporary hyperæmia a certain slight disturbance of accommodation was noted. The pupillary action and intraocular tension were not affected under stovaine anæsthesia.

De Lapersonne performed eighteen cataract extractions and four iridectomies and sclerotomies. The necessary anæsthesia was produced in two minutes. The corneal section was not felt, but cutting of the iris was painful. Slight opacity of the corneal epithelium, which had no deleterious effect on the subsequent course, was observed in several cases. A 1 per cent. solution of stovaine was used for subcutaneous or subconjunctival injections in four operations for squint, six for chalazion, three tarsorrhaphies, and so on. In the subsequent cases the fixation of the tendon and in the lid operations the cutting of the tarsus were painful, but this has also been observed in cocaine anæsthesia and is no objection to the use of stovaine. Its only disadvantage in the form of instillations, when compared to cocaine, consists in the production of marked corneal injection, pain, and lesions of

the corneal epithelium; but it has the advantage of being without influence on the intraocular pressure. Its slight toxicity and great diffusibility, the latter on account of its action in dilating the blood-vessels, make it preferable to cocaine for subcutaneous or subconjunctival injections. A combination of cocaine and stovaine offers the advantages of both substances in many cases.

MIRONESCU (149) finds the physiological action of euphthalmin very similar to that of atropine, from which it differs only in degree; the only qualitative difference is a paralyzing action of euphthalmin on the rabbit's heart after intravenous injections of large doses.

SCHANZ (150) shows, in answer to Paul Knapp, that the addition of water to the yellow oxide ointment is not only not harmful but advantageous. As a base he advises white vaselin (Cheeseborough) or adeps lanæ in place of lanolin.

QURIN'S (151) tipped sounds are silver probes, 8 to 10*cm* in length and 0.2 to 0.4*cm* broad. They are "armed" at the end with appropriate agents, generally nitrate of silver.

PERGENS (152) recommends periscopic glasses, plano-convex, and Huyghen glasses, and ordinary biconcave lenses, in the order given. Crossed cylinders are the least advisable. The spectacle glasses should have a horizontal diameter of 58*mm* and a vertical diameter of 35*mm*.

LANGE (154) advises for the use of school-children a slate of white celluloid, 20*cm* wide and 15½*cm* long, and 1*mm* thick, which has the advantage that the black writing offers a strong contrast with the white background. Unless a special ink or a special pencil is used, traces are left upon the slate in spite of its being rubbed off.

BECKER (155) recommends as a dropper a conical glass rod ending in a rounded top, immediately above which there are several spiral grooves to increase the adhesion surface of the point and so retain a certain quantity of fluid.

BLACK (156) has devised a hollow cabinet for test types, the four translucent walls of which are illuminated by a light in the interior.

POLIGNANI'S (157) apparatus is a cubical metal box, of which each wall has an opening 3*mm* wide, covered by colored glass. This is illuminated by electricity from within, so that the examination can be made without a dark room.

Sections IV.–VII. Reviewed by Dr. G. ABELSDORFF, Berlin.

IV.—ANATOMY.

158. Bartels, M. **The fibrillar structure of the layer of ganglion cells of the retina.** *Zeitschr. f. Augenheilk.*, xi., 4, p. 289.

159. Bernheimer, H. **Commencement and termination of the oculomotor nerve in the middle cerebrum.** *Monatsschr. f. Psychiatr. u. Neurol.*, xiv. (A correction of Majano's article in the same number, bearing the same title.)

160. Zietschmann, O. **Comparative histological examinations on the structure of the lids of domestic animals.** *v. Graefe's Arch. f. Ophthalm.*, lviii., 1, p. 61.

161. Ognew. **Müller's retinal fibres.** *Westn. Ophth.* 1904, No. 4.

BARTELS (158) was able to demonstrate the fibrillary structure of the ganglion cells of the retina even in the cadaver by means of the silver impregnation method of Bielschowsky. The fibrils could be traced from the dendrites directly into the axis-cylinder process, and, on the other hand, from one protoplasmic process to the other, so that no radical distinction could be found between axis-cylinder and protoplasmic process.

ZIETSCHMANN (160) examined the eyelids of the horse, ox, sheep, goat, swine, dog, and cat. The cilia of the upper lid are well marked in all animals, those of the lower lid more or less rudimentary. A ciliary muscle is well marked only in the ruminants; Henle's glands only in the horse. In this animal the transition from laminated pavement epithelium into the typical conjunctival epithelium, which is gradual in most animals, appears remarkably sudden.

OGNEW'S (161) interesting comparative studies of the structure and histogenesis of the retina in various animals convince him that small plates and membranes attached to Müller's fibroids, and apparently connected with them, which are most developed in the reticular layers, should not be considered as integral components of the supporting fibres. The entire network of membranes which invests the cellular elements of the retina is to be considered as a nutrient fluid, circulating between the retinal cells and their branches, which becomes solidified in the course of histological preparation. It may also have the significance of a cementing substance.

V.—PHYSIOLOGY.

162. Piper, H. **The electromotor action of the retina in cuttle-fish.** *Arch. f. Anatom. u. Physiol.*, Physiological Section, p. 453, 1904.

163. Hilbert, R. **Attempt to establish a system of physiological color sensations and a contribution to the understanding of them.** *Klin. Monatsbl. f. Augenheilk.*, xlii., vol. i., p. 405.

164. Klein, Fr. **The nature of irritation.** A contribution to the physiology of the sensory organs, especially the eyes. *Arch. f. Anatomie u. Physiologie*, Physiol. Abtheilung, p. 305, 1904.

165. Oerum, H. P. F. **Studies on the elementary terminal organs in regard to the perception of color.** *Skandinav. Arch. f. Physiol.*, vol. xvi. 1904.

166. Weinhold, M. **Explanation of the paradox, parallactic distortion of stereographic pictures.** *v. Graefe's Arch. f. Ophthalm.*, i., p. 202.

167. Spengler, E. **Curvature of the field of fixation.** *v. Graefe's Arch. f. Ophthalm.*, lviii., 2, p. 230.

168. Pino, C. **An explanation of erythropsia and the color of fading after-images.** *v. Graefe's Arch. f. Ophthalm.*, lviii., 1, p. 45.

169. Hess, C. **A singular process of excitation in the visual organ.** *v. Graefe's Arch. f. Ophthalm.*, lviii., 3, p. 429.

170. Kothe, R. **Longitudinal disparities and hyperplasticity of near objects.** *Arch. f. Augenheilk.*, xlix., 4, p. 338.

171. Hess, C. **Observation on the process of accommodation.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 309.

172. Feilchenfeld, H. **On the acuteness of vision in flickering light.** *Zeitschr. f. Psychol. u. Physiol. d. Sinnesorgane*, vol. xxxv., p. 1.

173. Schoen, W. **Paradic diplopia.** *Zeitschr. f. Psychol. u. Physiol. d. Sinnesorgane*, vol. xxxv., p. 132.

174. Heine. **Correct plastic in stereophotograms.** *Zeitschr. f. wissenschaftl. Photographie*, ii., 2 and 3.

175. Broca, Andre, and Sulzer, D. **The retinal functions in functions of time, inertia of form-sense, etc.** *Ann. d'oculistique*, cxxxi., p. 279.

176. Parinaud, H. **Stereoscopy and visual projection.** *Ann. d'oculistique*, cxxxi., pp. 241, 321, 401.

177. Stevenson, Edgar. **The influence of the semicircular canals on the movements of the head and eyes.** *Liverpool Med. and Chir. Jour.*, Jan., 1904.

178. Tscherning, M. **The mechanism of accommodation.** *Ophthalm. Review*, April, 1904.

179. Tschemollossow. **The influence of lateral illumination on central vision.** *Westn. Ophth.*, 1904, No. 2.

PIPER (162) examined the retina of a cuttle-fish to determine whether there was, in contradistinction to terrestrial animals, a greater susceptibility for green, blue, and violet light than for red and yellow rays, which are more strongly absorbed and cause the blue color of the water. The reaction of the retina was found to depend upon the intensity of the light stimulus, on the adaptation of the visual organ, and on the wave lengths of the light. It was found that the susceptibility of the retina in its

adaptation to prevalent conditions of illumination under the water surface reaches a maximum nearer to the red end of the spectrum than is usual in eyes which have become adapted to the light conditions of the atmospheric air.

OERUM (165) examined the visual acuity for various colors by determining, according to DuBois-Reymond, the distance at which a row of luminous points ran together. The illumination was colored by means of glass plates. The experiment showed that in the elementary colors, red, green, and violet, the points could be distinguished only at a distance which was much smaller than that for white light, so that the number of retinal cones to a given area is smaller than those for the perception of white light. If the number of cones in the fovea is estimated at 150, there will be 60 red, 50 green, and 40 blue percipient elements. The author believes it proven that there are special cones for each elementary color. In red-blindness the cones for the perception of green are differentiated so that they react to both red and green light, and *vice versa* in green-blindness.

SPENGLER'S (167) investigation treats of the following phenomenon. If a checkered pattern on a ground glass disk be observed from a short distance with monocular fixation, the tablet appears to bulge toward the observer. This curvature of the monocular field of fixation is explained by other examples of optical delusions, and determined by measurement.

PINO (168) established that the erythropsia following dazzling with white light is also to be observed during the dazzling occurring as a change from white to green-yellow and later to carmin. This colored vision is explained in the following way. As blood in a thin layer appears green, the light penetrating the vascular retina assumes a greenish hue, which we naturally do not see, as it is neutralized by the visual purple. When the latter is bleached by intense light, the yellow-green light is perceived as such. This stage is followed by erythropsia as a complementary after-image. The author also explains the colored fading away of after-images as well as the colored changes observed after long fixation of white light as perception of the visual purple.

HESS (169) describes the following phenomenon. After the lids had been closed for several minutes in a fairly light room, the eyes were directed for a second toward the evenly gray sky and then closed. At the point of direct vision a group of luminous points appeared, which remained visible for a fraction of a

second. As they disappeared, others were noted in the periphery near by, and others, less in number, still farther off. The change of position of this phenomenon is only apparent, and is caused by the appearance of new points close to the previous ones, which rapidly disappear. It is limited to the centre of the field of vision. Variations of the experiment show that these luminous points appear only at the point of direct vision, and that the color is hardly influenced at all by the color of the stimulating light.

Hess cites the following experiments to refute Tscherning's objections to the accommodation theory of Helmholtz.

(1) Tscherning found that the radius of the anterior surface of the lens in air did not correspond to that of the accommodating lens, so that the form of the latter could not be accepted as representing equilibrium. Hess now shows that the relative increase of weight of the lens after extraction (transition from water to air) produces a change of form which cannot be made to apply to the lens, surrounded as it is by water.

(2) Tscherning produced an increased curvature of the anterior pole of the lens by traction on the zonule of the isolated lens of the ox and dog. Hess proves by examination of the anterior lens reflex that when the lens of man or apes remains in connection with the ciliary body, traction on the zonule decreases the curvature of the pole, while relaxation of the zonule increases it.

(3) Tscherning explains the sinking of the lens in accommodation as a sinking not of the entire lens, but of the free lens mass in the capsule, in consequence of relaxation of the posterior capsule, when the anterior capsule is stretched. Hess was able to show in a patient with brown punctate opacities on the anterior surface of the lens, that these points participated in the sagging of the lens, so that the anterior capsule must be concerned, as well, in this movement.

Feilchenfeld (172) found that rotating disks composed of transparent and opaque sectors, brought between the eye and an object, reduced the visual acuity when the rotation was sufficiently rapid to produce a sensation of flickering, although the shortened exposure was compensated by prolongation of the observation time.

Schoen (173) explains strabismus cases with paradox diplopia (convergence with crossed images, divergence with homonymous

images) in the following manner. He observed patients in whom typical and regular diplopia was found, when motions of the eye were excluded, while paradox diplopia was produced by motions of the eye. The motions of the eye are referred (as we have no knowledge of their change of position) to a movement of the object which would have produced a similar movement of the image on the retina. The projected picture is then localized accordingly by the squinting eye.

PARINAUD (176) presents his theory of stereoscopic vision *in extenso.* He defines his conception of the line of sensation, line of projection, projection centre, optical axis or principal sensation axis, and principal projection axis. His former definition of the projection axis as a line drawn from the retinal point at which the exteriorations of visual perception originate, to the posterior nodal point, has been amended, in recognition of Nicolgi's objection, that this definition presupposes in a case of faulty projection two different retinal points: one for sensation and one for projection. According to Parinaud, stereoscopic vision depends upon the perception of virtual images. Stereoscopic relief is caused by localization in space of binocular projection images, which varies according as these images are externalized by identical or non-identical retinal points. The variation in each case is produced by the localization of the projected images in the intersecting line of the projecting axis. The characteristics of stereoscopic images and the rôle of the projection image in vision are also considered.

STEVENSON (177) publishes the results of experiments made under Goltz and Ewald in 1891, to determine the influence of irritation and destruction of the semicircular canals on movements of the head and eyes of animals.

TSCHERNING (178), in answer to Grossmann (Ophthalmological Section, British Medical Association, 1903), comes to the conclusion that in accommodation the ciliary muscle exerts traction on the lens nucleus, and so enlarges or dilates Cloquet's canal and changes the curvature of the posterior surface of the lens.

TSCHEMOLOSSOW (179) discusses (1) the variation in monocular central perception under various intensities of illumination of the fixed object and of lateral illumination; (2) the importance of the size of the pupil in lateral illumination through the pupil

and through the sclera; (3) the influence of lateral illumination and monocular color sensation; (4) change in monocular central vision, caused by double lateral illumination; (5) the influence of lateral dazzling of one eye and central vision of the other; (6) variations in binocular vision caused by simultaneous lateral dazzling of both eyes; (7) practical considerations in regard to the protection of the eye against lateral dazzling. His results are as follows:

Monocular vision is sometimes reduced and at other times increased by lateral illumination of the fixing eye; decreased when the fixed object is weakly illuminated, in direct proportion to the intensity of the lateral illumination and in direct proportion to the angle of incidence of the sidelight. Increase of central perception is only seen when the central fixed object is sufficiently or a little more strongly illuminated. The diminution of vision is the result of the picture of the light source being mirrored on the fundus, and also of the diffuse light which penetrates the walls of the eye, and of the pupillary contraction, which latter diminishes the luminosity of the fixed object. Increase in central perception is the result of pupillary contraction and of the increased sensitiveness of the eye produced by weak sidelight. Lateral illumination of one eye affects the vision of the other in exactly the same way as it is affected itself, but less so. Lateral illumination of the eye in practical life often causes complaints which may be relieved by the use of diaphragms.

VI.—REFRACTION AND ACCOMMODATION.

180. Osterroht. **A case of high hypermetropia, with congenital microphthalmus and internal complications.** *Beitr. z. Augenheilk.*, No. 60, p. 33.

181. Sattler. **Principles in the treatment of myopia.** *Deutsche Klin.*, 1904, p. 82.

182. Stilling, J. **Concerning the question of myopia.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 557.

183. Brandes, J. **Astigmatic accommodation under the localized influence of homatropine and eserine.** *Arch. f. Augenheilk.*, xlix., p. 255.

184. Römer, Paul, and Stein, Ludwig. **Experimental contribution to the question as to the seat and nature of the accommodation paresis in bacterial intoxication.** I.—*v. Graefe's Arch. f. Ophthalm.*, lviii., 2, p. 291.

185. Valiet. **A case of correction of astigmatism in an anisometrope, with experimental verification of the binocular vision by the aid of Dr. Remy's diploscope.** *Recueil d'ophtalm.*, xxvi., p. 265.

186. Polack, A. **Effects of refraction in color vision.** *Compt. d'Académie des Sciences*, Paris, June 13, 1904.

187. Lagrange. **Treatment of high myopia by extraction of the lens.** *Acad. de Méd. de Paris*, June 7, 1904.

188. Snell, S. **The removal of the lens in high myopia, illustrated by sixty cases.** *Amer. Jour. of Ophth.*, April, 1904.

189. Ask, Fr. G. **Stilling's theory of myopia.** *Hygiea*, 1904,

190. Widmark, J. **Myopia in the school at Djursholm, with observations on the subject.** *Hygiea*, 1904. (After a paper read in the Swedish Medical Society on March 29, 1904.)

191. Hirschberg, J. **The treatment of myopia.** *Deutsche Klinik*, 1904, p. 82.

Osterroht (180) observed a peasant of twenty-two, with H 19 D; vision in both eyes $\frac{3}{35}$; hemeralopia and marked contraction of the visual field. The eyes were small. There was persistent hyaloid membrane. The left disk showed medullated nerve fibres, and there was retinitis punctata albescens, with black pigment patches resembling bone corpuscles, in the periphery. Consanguinity was marked, as maternal grandfather and paternal grandmother were brother and sister. Four of the patient's brothers and sisters, and his mother, had H 1 to 2 D. An elder brother had H 15 D, with congenital microphthalmus.

Sattler (181) discusses current principles in the treatment of myopia and insists, on the basis of his personal experience, on permanent and complete correction, even in slight degrees of error.

Stilling (182) admits Hamburger's observation that the furrow on the globe produced by the tendon of the oblique muscle is a post-mortem phenomenon, but this shows that during life, too, a certain pressure can be exerted upon the globe. The insertion and course of the muscles are the principal points.

Brandes (183) experimented on astigmatic accommodation by applying grains of eserine or homatropine to a circumscribed point of the sclero-corneal margin. He found astigmatic accommodation on the average of 1 D, occasionally 1 to 2 D with eserine. This was of a temporary character, as the alkaloids are rapidly diffused through the entire ciliary muscle.

Römer and Stein (184) investigated the paresis of accommodation occurring in infectious diseases, by injecting the toxin of the bacillus botulismus (sausage poisoning), producing marked constitutional symptoms and pupillary dilatation. Anatomical

investigation showed degeneration in the region of the oculomotor nucleus, particularly in the accommodation centre. The authors conclude that the accommodation paresis in botulism is caused by toxic degeneration of ganglion cells in the nucleus.

LAGRANGE (187) reports twenty cases of extraction of the lens for high myopia, in which at least two years had passed since operation. In no case had the fundus changes progressed. Detachment was not observed. Visual acuity was doubled or trebled after operation, which should not be performed in myopia of less than 17 D.

SNELL (188) reports sixty operations, all but one on patients below forty years. In twenty-eight operations the myopia was greater than 20 D; the lowest was 10 D. The operation should be limited to myopia above 14 D. In each case the capsule of the transparent lens was split, and about a week later the softened lens masses were let out. In cases of glaucoma immediate evacuation was successfully employed. Detachment was seen in only two cases, and does not seem to be a great danger.

WIDMARK (190) notes that myopia in the school at Djursholm, a suburb of Stockholm, is very much less frequent than in the corresponding schools of the latter city, and that the myopia is less marked, and the vision better. Hygienic conditions of the school itself do not seem to play any rôle, as the city schools have at least equally good light, benches, blackboards, and so forth. The only difference is to be found in the fact that the children in the country school spend a great deal of the time in the open air in sports and gymnastics. W. shows statistically that myopia in the higher schools of Sweden has diminished notably in the last twenty years. This is attributed to a change in the curriculum, the classics having been supplanted more and more by laboratory work, while much importance is attached to physical exercise outdoors.

HIRSCHBERG (191) discusses the treatment of myopia in a lecture intended for wider medical circles. He is opposed to permanent complete correction, and prescribes neutralizing glasses, for distance only, in medium grades of myopia ($3\frac{1}{2}$ to 6 D). Subconjunctival injections of salt solutions for myopic changes in the fundus are considered by H. as "a form of solace, not of treatment." The operative removal of the lens for myopia, which is indicated only if the patient be otherwise entirely helpless,

should be performed only on one eye. H. opposes Stilling's theory that there are two separate forms, occupational myopia and deleterious myopia, and from the experience that myopia develops during school years draws the corresponding hygienic conclusions.

VII.—MUSCLES AND NERVES.

192. Gamble, W. E. **A statement of our present knowledge of the architecture of the cerebral visual apparatus in the light of the neuron theory and the later clinico-pathologic investigations.** *Ann. of Ophth.*, April, 1904.

193. Werner, Louis. **A case of recurrent paralysis of the third nerve.** *Ophth. Review*, May, 1904.

194. Theobald, S. **A case of over-correction of convergent squint without operation.** *Amer. Jour. of Ophth.*, April, 1904.

195. Wilkinson, O. **Two cases of rare nervous lesions of the eyes.** *Ophth. Rec.*, May, 1904.

196. Bielschowsky, A. **On paralysis of the inferior oblique.** *Graefe's Archiv*, lviii., 2, p. 368.

197. Oppenheimer, E. **Unilateral nystagmus.** *Deutsch. med. Wochenschr.*, 1904, 23.

198. Bechterew. **The participation of the orbicularis in cortical and subcortical facial paralysis.** *Centralbl. Nervenheilk.*, vol. xxvii., p. 305.

199. v. Hippel. **Recent investigations on the physiology of pupillary phenomena.** *Münch. med. Wochenschr.*, 1904, 16 and 17.

200. Gradle, H. **Paralysis of the associated lateral eye movements, presumably due to polioencephalitis superior, ending in recovery.** These ARCHIVES, xxxiii., 3, p. 268.

201. Frank, Mortimer. **Hysterical iridoplegia and cycloplegia, with report of a case.** These ARCHIVES, xxxiii., 3, p. 299.

202. Grossmann, Karl. **Paralysis and paresis of both third nerves and the left fifth nerve.** *Liverpool Med. and Chir. Jour.*, Jan., 1904.

203. Parsons, T. Herbert. **The innervation of the pupil.** *Royal Lond. Ophth. Hosp. Rep.*, vol. xvi., pt. 1.

204. Landolt, E. **Surgical intervention in disturbance of the motor apparatus of the eye.** *Arch. d'opht.*, xxiv., No. 5, p. 257.

205. Tschirkowsky, W. **Movements of the iris after section of the optic nerve in mammals.** *Neurolog. Westn.*, vol. xi., No. 4.

206. Popow, N. M. **Disturbances of the associated eye movements.** *Neurolog. Westn.*, vol. xi., No. 1.

207. Roche. **Contribution to the study of traumatic ocular paresis of orbital origin.** *Thèse de Paris*, 1904.

208. Delage, Yves. **On torsion movements of the eye.** *Rec. d'opht.*, xxvi., p. 193.

209. Grasset, T. **On deviation, in opposite directions, of eyes and head.** *Sem. méd.*, No. 20, 1904, p. 153.

210. Remy. **Use of the diploscope.** *Rec. d'opht.*, xxvi., p. 210.

211. v. Dyk. **Statistic observations on non-occupational myopia.** *Dissertation*, Amsterdam, 1904.

212. Koster. **Monocular diplopia without physical cause after cure of divergent squint.** *Med. Tydsch. v. Geneesk.*, 1, No. 26, 1904.

WERNER'S (193) patient was a healthy-looking woman aged twenty who had defective vision of the right eye due to astigmatism. Since childhood she had been subject to periodical attacks of headaches and vomiting, at intervals of four to six weeks. During the last three years the right eyelid had begun to droop and then to close, and this remained so for six weeks. After this the power of opening it returned, but after two years a severe attack brought it on again and diplopia developed. The eye remained closed for three weeks and again recovered. Another curious symptom was excessive salivation during the attacks.

MARSHALL.

A case of marked fixed convergent strabismus in an amblyopic eye was treated by THEOBALD (194) with lenses, correcting the hypermetropia and astigmatism, together with a prism 2° base out. After two years there was only slight convergence. One year later there was evident divergent squint with slight improvement of vision in the squinting eye. The behavior of eye is attributed, by the author, to the effect of the glasses.

ALLING.

In an attempt to account for a case of oculomotor paralysis, WILKINSON (195) believes that he has excluded every other cause except tobacco. The patient's recovery was coincident with leaving off the use of tobacco. The other case was that of a man of thirty who had suffered all his life from a peculiar defect in the movement of the lid. The right upper lid was lifted involuntarily when the mouth was opened. In chewing, the effect was unpleasant.

ALLING.

BIELSCHOWSKY (196) reports four cases of paralysis of the inferior oblique. In one, there was choroiditis at the macula, and transitory exophthalmus, so that orbital disease was suspected. In the second case, a woman with chronic arthritis, there was alternating paralysis of the inferior and of the superior oblique, and later of both inferior obliques. A third case, in a man of forty-five, was a symptom of cerebro-spinal syphilis. In the last case, paralysis was due to fracture of the base of the skull following a fall.

GRADLE's (200) patient, a man of thirty-four, had paralysis of associated lateral movements with vertical nystagmus. Convergence was preserved. There was for a time pallor of the nerve head, and diminution of vision amounting almost to blindness in the left eye. The motor disturbances disappeared in six weeks. The visual disturbance, probably due to intracranial optic neuritis, recovered in the course of a year.

FRANK (201) reports the case of a woman with left pupillary paralysis and cycloplegia, contraction of the visual field, and hyperæsthetic areas on the left side of the body. A cure resulted in a few months. Hysteria was the ætiologic factor.

GROSSMANN'S (202) patient, a woman of thirty-eight, had been well until three years previously. After a severe cold, continuous headache, inflammation and anæsthesia of the left eye and left side of the face, developed. The headaches finally disappeared, the other symptoms persisted. Both upper and lower recti are paralyzed, both interni paretic. The cause is probably a circumscribed meningitis (gumma ?) over the left side of the pons.

PARSONS (203) experimented on cats, dogs, and apes. After section of the cervical sympathetic, he observed distinct mydriasis on stimulation of the cerebral cortex. This did not appear when the oculomotor nerve had been divided intracranially, so that this nerve may receive an inhibiting stimulus from the cortex. As dilatation is caused principally by stimulation of cortical areas related to motor or sensory stimulation of the eye, the phenomenon is an associated one.

LANDOLT (204) prefers advancement to tenotomy, particularly in concomitant squint with binocular vision, and in paralytic squint. Tenotomy does not merely remove the surplus of muscular action, but the latter eventually becomes too weak, as the innervation impulse diminishes after operation. Secondary squint may then ensue. v. MITTELSTÄDT.

TSCHIRKOWSKY (205) demonstrates that after division of the optic nerve the pupil dilates only when tactile stimulus is applied. The latter reaction does not take place after section of the cervical sympathetic or extirpation of the ganglion.

HIRSCHMANN.

POPOW (206) reports two rare cases of associated eye movements: 1. General malaise, diplopia, disturbed equilibrium, con-

vergence, with normal motility, paralysis of abduction, probable affection of the frontal lobe. 2. A feeble old woman with general atheromatosis. Sudden paralysis of all branches of the right facial, left hypoglossus, and right extremities, with disturbance of associated eye movements to the right. Otherwise normal motility. Hemorrhage or thrombosis in the anterior portion of the pons and corpora quadrigemina must have been the cause.

HIRSCHMANN.

GRASSET (209) shows that conjugate deviation of the eyes and head cannot always be explained by Bard's hypothesis that in hemianopia the patients tend to look toward the side on which vision is preserved. In his case there were left hemiplegia, hemianæsthesia, deviation of the eyes to the right, and of the head to the left. Autopsy showed a hemorrhage in the optic thalamus and internal capsule. This probably caused irritation of fibres associated with head-turning to the left and paralysis of those turning the eyes to the left. Both sets of fibres are situated in the thalamo-capsular zone. BERGER.

REMY (210) discusses the practical application of his diploscope for the treatment of neutralization following squint.

BERGER.

KOSTER (212) reports the case of a patient of ten, with divergent strabismus of 20°, of five years' standing. Parallelism, but with homonymous diplopia apparently corresponding to a convergence of 20° immediately followed operation. Ten days after tenotomy, monocular diplopia, right, was found. Koster thinks this was probably due to the formation of a secondary macula as a consequence of indirect fixation. The real fovea rapidly regains its original supremacy if central vision has been retained.

JITTA.

Sections VIII–XII. Reviewed by DR. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

213. Albrand, W. **Scalp and margins of the lid.** *Deutsche med. Wochenschr.*, 1904, No. 29.

214. Snydacker, E. F. **A case of persistent œdema of the eyelid, due to syphilis.** These ARCHIVES, xxxiii., 2, p. 139.

215. Kornacker, O. **Initial sclerosis of the lids.** *Inaug. Dissert.*, Berlin, 1904.

216. Cange, A., and Bentami. **On the treatment of total trichiasis.** *Arch. d'ophtalm.*, xxiv., No. 4, p. 220.

217. Villard, H. **Treatment of trichiasis of the upper lid by tarso-marginoplasty.** *Recueil d'ophtalm.*, xxvi., p. 271; *Soc. franç. d'ophtalm.*, May 3, 1904.

218. Villard, H. **Treatment of trichiasis of the upper lid by tarso-marginoplasty.** *Annales d'ocul.*, cxxxi., p. 439; *Soc. franç. d'ophtalm.*, 1904.

219. Fergus. **An easy ectropion operation.** Report in *Arch. f. Augenheilk.*, xlix., 4, p. 354.

220. Hale, A. B. **A new procedure of blepharorrhaphy.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 577.

221. Skorobogaty, A. **The technique of canthoplasty.** *Westn. Ophth.*, 1904, No. 4.

222. Grüning, E. **Treatment of the various forms of ptosis by partial resection of the tarsal cartilage.** *N. Y. Eye and Ear Infirmary Reports*, Jan., 1904.

223. Gendron. **A case of ptosis of inflammatory origin, cured by the Motais operation.** *L'ophtalm. provinciale*, 1904, p. 23.

224. Terson, A. **Relaxed skin of the lid.** *Arch. d'ophtalm.*, xxiv., No. 6, p. 346.

225. Jerussalimski, M. J. **Two cases of unilateral essential blepharospasm.** *Wojenno Med. Jour.*, April, 1904.

226. Rogman. **New operative procedure to correct epicanthus.** *Annales d'ocul.*, cxxxi., p. 464.

227. Zeller, Otto. **Dermal cysts of the lid.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1. p. 461.

228. Grossmann, Karl. **Cyst of lower lid in a case of unilateral anophthalmos.** *Liverpool Med. and Chir. Jour.*, Jan., 1904.

229. Oeller, J. **A supernumerary, monstrous upper lid, with upper-lid coloboma of both eyes.** *Arch. f. Augenheilk.*, l., 1, p. 1.

230. Wicherkiewicz. **An appropriate procedure for small lid colobomata.** *Arch. f. Augenheilk.*, l., 2, p. 166.

231. Birch-Hirschfeld, A. **Concerning the anatomy of lid xanthelasma.** *v. Graefe's Archiv f. Ophth.*, lviii., 2, p. 207.

ALBRAND (213) considers the treatment of dandruff and similar affections absolutely necessary for the definite cure of many marginal affections of the lid.

SNYDACKER'S (214) patient, who had had an initial lesion seven years before, observed an œdematous swelling of the left upper lid since several months. An inunction cure and potassium iodide administrations made this disappear entirely.

KORNACKER'S (215) patient had a triple lid chancre.

CANGE and BENTAMI (216) cured trichiasis in five cases by the formation of two bridge flaps, each 4*mm* wide. The first includes the lid margin with the cilia, and the other, which is

made as thin as possible, is immediately above the first and is passed under it and fastened to the lid margin by sutures, the upper margin of the flap, containing the cilia, being fastened to the upper wound edge in the lid skin. After the epidermis has been shed, the cross-points of the flap grow together quite well and the original thickening of the margin disappears completely.
v. MITTELSTÄDT.

For the shortening of the lid fissure, HALE (220) forms two flaps at the outer canthus, a skin flap without conjunctiva or hair-follicles from the upper lid, and a subcutaneous flap on the lower lid. One is then sutured upon the other.

SKOROBOGATY (221) passes two silk ligatures through the entire thickness of the upper and lower lids from the conjunctival surface, 3 to 4*mm* to the median side and 3*mm* from the free margin. These are used as retractors for holding the lids during operation. After the usual canthotomy with scissors, he divides the mucous membrane and skin at the outer angle, in this way facilitating correct suturing. HIRSCHMANN.

GRÜNING (222) operated on twelve cases of ptosis of various forms by resection of part of the tarsal cartilage by a modification of Gillet de Grandmont's method. ALLING.

TERSON (224) reports three cases of relaxation of the lid skin (blepharochalasis, Fuchs), in two females of twenty-two and eighteen, and one man of twenty years of age. Twice, both lids were affected. The author believes that we have to deal with trophoneurotic disturbances of the fibres of the levator which radiate in the layers of the skin of the lid, due to affection of the sympathetic, and that the name dermatolysis characterizes the curtain-like falling of the lid skin. The treatment, after removal of the skin fold, must include the attachment of the skin to the tendon of the levator, or to the upper margin of the tarsus, if relapses are to be avoided. v. MITTELSTÄDT.

In JERUSSALIMSKI'S (225) two cases, tonic blepharospasm was noted in the right eye after injury to the right side of the brow. Pressure points could not be found in either case, one of which lasted forty-eight days; the other remained under treatment for half a year without improvement. Jerussalimski considers both cases instances of traumatic neurosis. The spasm is not reflex, but caused by direct irritation of the terminal fibres of the facial nerve. HIRSCHMANN.

ROGMAN (226) describes an operation for epicanthus, which is particularly applicable where there are cicatrices. This was used with good result in a girl of twenty-five with epicanthus, slight ptosis, and blepharophimosis. The usual methods heretofore recommended consist in the excision of a skin fold over the bridge of the nose (Ammon), which is insufficient; the excision of the fold itself (Arlt), which causes disfigurement (Knapp); or in the excision of an oval or angular flap at the side of the nose (Berger and R. Loewy), by which the epicanthus fold is obliterated by traction. Rogman produced a similar result by a Y-shaped incision, with undermining of the flap and vertical displacement. The incision in the form of a Y may also be used. One limb may be prolonged into the epicanthus fold, where the incision is made at the side of the nose. BERGER.

ZELLER (227) describes cysts of the integument, which were probably formed by retention in the sweat glands of the lid.

GROSSMANN'S (228) patient was a girl of sixteen years of age, with congenital anophthalmos. Grossman removed the cyst of the lower lid, as an artificial eye could not be worn. Microscopic examination showed that the cyst contained a rudimentary eye. DEVEREUX MARSHALL.

In OELLER'S (229) case of a new-born child there was observed, hanging from the outer third of the lid fissure on both sides, a round tumor, covered with cutis, and reaching to the orbital margin. This was fastened to the upper fornix fold by a pedicle covered with mucous membrane. At a corresponding point the upper lids had a nick, 2 or 3*mm* deep, in which the cilia and the intermarginal rim were missing. In the tumors, which were 2*cm* long, cartilage was found. Oeller considers them to be supernumerary lids, and compares them with congenital conjunctival folds, which were already described by v. Graefe.

WICHERKIEWICZ (230) finds that the simple freshening and suturing of coloboma produces no permanent results. He splits the lid into two lamellæ, by which the angle between the limbs of the coloboma is increased and relaxed. A skin flap is then transplanted into this space.

BIRCH-HIRSCHFIELD (231) lays stress upon the staining with sudan. The xanthelasma cells contain, besides fat, a protoplasm which can hardly be stained. They are of endothelial nature, and probably originate from the perithelium of vessels

around which they are found grouped. In regard to the location of xanthelasma around the inner canthus, he calls attention to the fact that this region is particularly rich in arterial and venous anastomoses, and also to the changeable bluish or brown discoloration and œdema, which are seen under physiological conditions.

IX.—LACHRYMAL APPARATUS.

232. Natanson, A., Jun. **Experimental investigations of the changes of the lachrymal glands after extirpation of their excretory ducts.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 541.

233. Santucci, St. **Traumatic prolapse of the lachrymal glands and appropriateness of their extirpation.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 147.

234. Aubaret et Lason, Ch. **A case of fistula of the lachrymal gland.** *Soc. d'anat. et de physiol. de Bordeaux*, October 26, 1903.

235. Auerbach. **Actinomyces concrements in the canaliculi.** *Arch. f. Augenheilk.*, xlix., 4, p. 316.

236. Gellé, G. **The rôle played by nasal lesions in the pathogeny of lachrymation.** *Arch. intern. de laryngol., otol., et de rhinol.*, Jan.-Feb., 1904.

237. Komarowitsch, L. **Irrigations of the lachrymal sac through the lachrymal points.** *Westn. Ophth.*, 1904, No. 2.

238. Belbèze, R. **Treatment of acute dacryocystitis by aspirating puncture and injection of oxygenized water.** *Arch. générales de méd.*, 1904, p. 1246.

239. Strackow, W. P. **Extirpation of the lachrymal sac.** *Westn. Ophth.*, 1904, No. 2.

NATANSON (232) experimented on dogs, to determine whether the orbital lachrymal gland retained its function after the removal of the accessory gland in extirpation of the sac. He removed the excretory duct of the orbital gland, and, after two, four, and six weeks found the epithelium diminished and the protoplasm almost entirely disappeared and not capable of secretion. The connective tissue was hardly changed.

SANTUCCI (233) considers the advisability of extirpating the prolapsed lachrymal gland. It is often impossible to bring it back to its original position, and then causes deformity of the lids, ptosis, formation of nodules, and atrophy of the dislocated gland. The loss of secretion only becomes noticeable in crying, and this is often so slight, on account of the presence of accessory glands, that lachrymation is not cured by the operative removal of the principal gland.

AUERBACH'S (235) patient showed visible disease of the cana-

liculi after injury. On pressure, after slitting, some pus could be emptied, containing grayish-yellow grains, which morphologically and microchemically were found to be actinomyces of an atypical form. Cultures and inoculation of animals showed that infection with actinomyces could easily be produced. Auerbach endeavors to show that cases of leptothrix and streptothrix of the canaliculi were probably actinomycotic affections.

GELLÉ (236) examined 100 cases of epiphora in De Lapersonne's clinic, and found affections of the nasal passages very frequent. Normal condition was found in 37 cases, spurs of the septum in 13 cases, deviation in 5 cases, hypertrophy of the inferior turbinate in 15 cases, hypertrophic rhinitis in 4 cases, purulent rhinitis in 10 cases, ozæna in 6 cases, nasal hydrorrhœa in 2 cases, polypi in 2 cases, tertiary syphilis in 6 cases, anæmia in 1 case, tuberculosis in 2 cases. Gellé believes that the communication of ocular affections with coincident nasal diseases is to be explained by infection. Galvano-caustic treatment of hypertrophic nasal catarrh in 19 cases was without effect on the epiphora. BERGER.

KOMAROWITSCH (237) has modified Neustätter's syringe; the canula is bent at an angle; the point is blunt and ends obliquely. It can be easily introduced into the lower canaliculi, when the lower lid is drawn off slightly. Komarowitsch advises irrigation of the lachrymal passages in hypopyon-keratitis and as a prophylactic in operations on the globe. HIRSCHMANN.

In the Eye Infirmary of Moscow, STRACKOW (239) reports 138 extirpations of the lachrymal sac on 124 persons, during the last four and a half years. The results were satisfactory. The operation was that of Kuhnt, modified by Strackow, and consisting in a division of the canthal ligament close to the crista lacrymalis, and its separation from the anterior surface of the sac, after which the capsule is split and the sac shelled out with scissors. HIRSCHMANN.

X.—ORBIT AND ACCESSORY CAVITIES.

240. Heerfordt, C. F. **Emphysema of the orbit.** *v. Graefe's Arch. f. Ophth.*, lviii., 1., p. 123.

241. Salzer, Fritz. **An unusual injury of the orbit by a foreign body.** *Münch. med. Wochenschr.*, 1904, No. 25, p. 1115.

242. Schischkin, J. P. **A cartridge-cap in the orbit; extraction; recovery.** *Wojenno Med. Jour.*, April, 1904.

243. Ferron, Michel. **Lesion of the orbital nerves in their intracranial course in consequence of bullet wounds.** *Ann. d'ocul.*, cxxxi., p. 360.

244. Ridley. **A case of arterio-venous aneurysm of the orbit, which showed a relapse six months after ligature of the common carotid.** Report of meeting of the English Ophthalmological Society. *Arch f. Augenheilk.*, xlix., 4, p. 356.

245. Veasey, C. A. **Report on a case of congenital exophthalmos, caused by orbital hemorrhage following metastatic choroiditis.** *Ophth. Record*, May, 1904.

246. Becker, H. **Two cases of pronounced unilateral exophthalmos with tumor cerebri, and Krönlein's operation.** *Gesellsch. f. Natur- und Heilkunde zu Dresden*, 30, iv., 1904; *Münch. med. Wochenschr.*, 1904, No. 27, p. 1221.

247. Sattler, H. **A case of pulsating exophthalmos.** *Med. Gesellsch. zu Leipzig*, 3, v., 1904; *Münch. med. Wochenschr.*, 1904, No. 26, p. 1176.

248. Van Duyse. **Pulsating exophthalmos, with mucous pseudocystic fibro-sarcoma of ethmoidal origin.** *Arch. d'opht.*, xxiv., No. 5, p. 288.

249. Moissonnier. **Relapse of orbital cylindroma. An anatomico pathological study.** *Arch. d'ophtal.*, xxiv., No. 6, p. 388.

250. Joussemet. **Treatment of exophthalmic goitre with salicylate of soda.** *Thèse de Paris*, 1904.

251. De Lapersonne, F. **Exophthalmic goitre involving the loss of the globe.** *Soc. d'opht. de Paris*, March 1, 1904.

252. Sattler. **Ocular symptoms of Basedow's disease.** *Deutsche med. Wochenschr.*, 1904, No. 14, Vereinsbeilage, p. 527 (Med. Gesellsch. in Leipzic, Jan. 12, 1904).

253. Reinewald. **Killian's radical operation in chronic empyema of the frontal cavity.** *Deutsche med. Wochenschr.*, 1904, No. 5, Vereinsbeilage, p. 189 (Med. Gesellschaft in Giessen, Nov. 24, 1903).

254. Posey, W. C., and Swindells, W. C. **Unilateral exophthalmos in exophthalmic goitre, with a report of a case.** *Ophth. Rec.*, May, 1904.

HEERFORDT (240) proves that emphysema of the orbit must break through the orbital fascia in order to become a lid emphysema, after which it may spread over the face. Pure palpebral emphysema is rare and caused by fracture of the lachrymal bone in front of the orbital fascia. After injury of the bone, air blown from the nose can only reach the lid after expiratory pressure has burst the orbital fascia, for which, according to H's experiments, 45*mm* mercurial pressure is not sufficient. The membrane withstands a pressure of 120*mm* in young persons and is reduced in the aged to 25 and 15*mm*. In one case injury of globe followed pressure by the emphysema.

In SALZER's (241) case the frozen end of a leather whip-lash

passed through the skin into the orbit and could not be detected with the sound. After three weeks it was expelled by suppuration.

SCHISCHIN (242) reports phthisis bulbi and a fistular opening below the middle of the upper orbital margin. After enlarging the wound and the fistulous tract, a cartridge cap was removed, measuring $6\frac{3}{10}cm$ in length. It had destroyed the globe and must have perforated the bone at the apex of the orbit.

HIRSCHMANN.

VEASEY (245) saw an infant two days old which presented an exophthalmos, increasing since birth, and accompanied by profuse hemorrhage from the conjunctiva and the buccal membrane. Later on multiple hemorrhages in the skin of the entire body appeared. The child was otherwise well. On the eleventh day pus appeared in the globe, which had to be enucleated. A large blood clot was found behind the eyeball, with purulent inflammation of the iris, ciliary body, and choroid. ALLING.

BECKER (246) found no tumor in the orbit in exophthalmos cases, but in one case a cavernous angioma of the size of a walnut in the temporal lobe. The eye had slightly protruded for a year, and suddenly protruded *9mm*, when the angioma burst. The blood had escaped into the sheath of the optic nerve.

In SATTLER'S (247) case the eyeball not only did not pulsate, but there was not even intraocular pulsation. A pulsating soft tumor in the region of the supraorbital notch gave out a blowing murmur on auscultation. Similar soft sacs were found at the side and the lower margin of the orbit. The diagnosis was that of arterio-venous aneurysm, caused by a blow on the upper orbital margin ten years before. The abducens was paralyzed, as is frequently the case. A piece of degenerated ophthalmic vein was resected. This was accompanied by arterial hemorrhage and followed by shrinking of the accessory tumors.

VAN DUYSE'S (248) case was one of fibro-sarcoma with partial myxomatous degeneration, having the appearance of a multilobular ovarial tumor, and growing from the middle ethmoidal cells. The growth had forced in the orbital wall and pushed the eye outward, downward, and forward, without interfering seriously with motility or vision. At the upper-inner orbital margin there was palpable pulsation isochronous with the radial

pulse, together with a constant murmur. Both phenomena diminished by compression of the carotid and disappeared after bilateral ligation. The patient died after showing symptoms of bulbar paralysis. At post-mortem there was found in the anterior fossa of the right side a protrusion of the bone of the size of an egg, which had been caused by the primary tumor; and to the left of the median line a secondary tumor, subdural, as large as a chestnut, with several smaller growths in the middle fossa: and one the size of a peach in the left half of the pons. The primary tumor had invaded all the accessory cavities, spreading the bridge of the nose, and partially destroying the bone. The pulsation and murmurs were communicated by the partially fluid contents of the tumors from newly formed vessels communicating with the anterior and posterior ethmoidal arteries, which were very numerous, although not large. New growths of the ethmoidal cells cause early orbital symptoms, and exophthalmos is frequently one of the first. v. MITTELSTÄDT.

MOISSONNIER (249) removed a cylindroma of the orbit originating in the lachrymal gland, which had relapsed three months after the first operation. It was situated at the upper margin of the orbit, and was covered with a fibrous capsule and had already attacked the bony margin. The second tumor was much richer in epithelial cells, partially in the form of glandular tubules, than the primary one, and had grown very much more quickly. There was no further relapse after seven months.

v. MITTELSTÄDT.

DE LAPERSONNE (251) presented a patient of thirty-five with Basedow's disease, and atrophy of the right eye in consequence of suppuration of the cornea. The latter was not to be explained by lagophthalmos, trophic disturbance, or infrequent winking, but was more probably due to the existing toxæmia in consequence of the changed conditions of the thyroidal secretion. Disturbances of motility in exophthalmic goitre, which have been considered a proof of the bulbar origin of this disease, may be caused by peripheral toxic neuritis. BERGER.

SATTLER (252) advises repeated measurements of the exophthalmos with Hering's apparatus. The murmurs, as described by Donders, could not be heard. Retraction of the upper lid is one of the symptoms noted. This cannot be due to any affection of the sympathetic, as it is wanting in the lower lid.

XI.—CONJUNCTIVA.

255. Fejér, J. **Affections of the tarsus with special consideration of the pathology of chalazion.** *Arch. f. Augenh.*, l., 1, p. 31.

256. Schieck, F. **Pathological anatomy of vernal catarrh.** *V. Graefe's Arch. f. Ophthalm.*, lviii., p. 1.

257. Johnston, R. H. **Vernal catarrh: a pathological study.** *Ophthalm. Record*, April, 1904.

258. Schottelius, E. **Bacteriological examination of measles-conjunctivitis.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 565.

259. Zur Nedden. **Croupous and diphtherial affections of the conjunctiva.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 439.

260. Likernik, M. **Simple mechanical treatment of trachoma.** *Westn. Ophth.*, 1904, No. 2. (Already discussed.)

261. Astwazaturow, L. P. **Granular affections of the lids.** (Classification, diagnosis. Treatment. Prophylaxis.) *Wojenno Med. Journ.*, April, 1904.

262. Braunstein, E. P. **Operative treatment of trachoma.** *Westn. Ophth.*, 1904, No. 3.

263. Rollet, Etienne. **Clinical symptoms of syphilitic chancre of the bulbar conjunctiva.** *Revue générale d'ophtalm.*, xxiii., p. 97.

264. Treacher Collins, E. **Primary chancre of the conjunctiva and interstitial keratitis.** *Royal London Ophthalmic Hospital Reports*, vol. xvi., p. 1.

265. Anderson. **Pemphigus of the conjunctiva of both eyes.** English Ophthalm. Society. *Arch. f. Augenheilk.*, xlix., 4, p. 358.

266. Mayon. **Pathological anatomy of the patches in epithelial xerosis.** Report of meeting of the English Ophthalm. Society. *Arch. f. Augenheilk.*, xlix., 4, p. 352.

267. Foster, E. E. **Unpigmented nævus conjunctivæ.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 525.

268. Denig, R. **Concerning the literature on pterygium and pseudopterygium of the upper lid.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 372.

269. Blessig. **Postscript to report on a "Case of rare malformation of the eyes; symblepharon," etc.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 464.

270. Hirsch, G. **Presence of a foreign body in the conjunctival sac for two years.** *Wiener. klin. Rundschau*, 1904, No. 33.

271. Neuimin, N. J. **A case of cysticercus cellulosæ beneath the conjunctiva of the lower fornix fold.** *Report of Meeting of the Caucas. Med. Society*, 1903, No. 12.

272. Oatman, E. **Epithelial cystoma of the conjunctiva.** These ARCHIVES, xxxii., 2, p. 113.

273. Johnston, R. H. **Subconjunctival dermolipoma.** *Ophthalm. Record*, May, 1904.

274. Johnston, R. H. **Papilloma of the conjunctiva.** *Oph. Record*, May, 1904.

In a woman with chalazia of both lids the tarsus swelled up after the exsection of the growth, and cystic degeneration of all the glands developed. FEJÉR (255) cut out these affected parts of the tarsus and defined the histological specimen as chronic tarsitis.

SCHIECK'S (256) anatomical specimens were taken from patients who had suffered from eye inflammations almost uninterruptedly for two or three years without any change in the appearance being noted in the warm seasons. The conjunctiva of the tarsus was covered with large flat or mushroom-like excrescences and with gray-red nodular growths at the limbus which encroached upon the cornea. These and the tarsus were extirpated. S. finds the principal proliferative changes not in the epithelium, but in the elastic fibres of the stroma. As these elastic fibres are present in equal anatomical proportions at the limbus and in the tarsal conjunctiva the growth at this point in vernal catarrh is explicable. For the treatment it is advisable to extirpate thoroughly.

JOHNSTON (257) examined a bit of tissue removed from the limbus in a case of vernal catarrh. The epithelium covering this mass was thickened and dipped deep into the stroma which consisted of connective tissue. ALLING.

AXENFELD remarks in a postscript to SCHOTTELIUS (258) that, as the bacteriological findings vary in different epidemics, it is the measles eruption which affects the conjunctiva, as these epidemics with virulent streptococci may also produce particularly severe complications, such as diphtheria and gangrene of the lids, as well as iritis.

ZUR NEDDEN (259) lays stress upon the clinical differentiation of croup and diphtheria. In the first form the coagulated secretions lie upon the conjunctiva. In diphtheria they are situated in or underneath this membrane and leave scars behind. Diphtheria, too, almost always affects the cornea. Diphtheria bacilli may also cause simple croup. In some croup cases no bacilli were found, nor could chemicals or foreign bodies be detected as a cause. Diphtheria without bacilli could not be demonstrated.

BRAUNSTEIN (262) gives a survey of the extent of trachoma in Russia and estimates the cases of those blind from this disease at $\frac{1}{4}$ of the entire number of blind in Russia. In 188 cases

Kuhnt's operative treatment was employed: the combined operation in 110 cases, and simple excision of the conjunctival fold in 78. In no cases were bad effects observed. Improvement was always marked, but a complete cure required a continuation of the usual trachoma treatment. The author advises operative treatment in cases of chronic trachoma where medicamentous and mechanical treatment is without effect. The good results depend greatly upon the skill and technique. Students in the clinic should be instructed in operative procedures, and post-graduate courses should be instituted in the universities for the instruction of the general practitioner.

HIRSCHMANN.

TREACHER COLLINS (264) reports four cases out of literature, and one of his own observation, in which a primary chancre of the conjunctiva was followed, within a space of time varying from five months to ten years, by interstitial keratitis in the originally affected eye. He reports another case in which interstitial keratitis developed three years after a chancre on the lid.

SCHULZ.

FOSTER (267) compares new growths of the conjunctiva, which have been described as dermo-epithelioma, angioma, and conjunctival cysts, and identifies them in part with unpigmented nævus of the conjunctiva. The latter is generally found on the conjunctiva of the globe in the region of the lid-fissure in the form of a flat yellowish-red growth, which has a tendency to enlarge without a change into a malignant tumor. This may depend upon the fact that these forms are not noticed as easily as pigmentous growths. They may cause a development of multiple cysts. The formation depends not only on epithelial inclusions, but also on mesodermal elements, particularly as regards the epithelia.

DENIG (268) refers to his publication on pterygium of the upper lid with an anatomical report published in the *Transactions* of the 71st Meeting of German Physicians in Munich, 1899.

HIRSCH (270) removed from the upper fornix a piece of straw 10*mm* long and 2*mm* thick which had swelled up and, after remaining in situ for a long time, caused suppuration, swelling and redness and proliferation of the conjunctiva, simulating trachoma. H. also reports a case of the insertion of a "crab stone" for the removal of a supposed foreign body from the conjunctival sac.

OATMAN (272) decides, as a result of his own observations and

a study of the literature, that the majority of cysts on the conjunctiva of the globe and of the tarsus are of epithelial nature. The point of origin is a proliferation of the deep epithelium of a crypt, or fold, of the conjunctiva. Degeneration of the central cells of the epithelium proliferating inward is followed by the formation of a cyst cavity. ABELSDORFF.

JOHNSTON (273) describes a large tumor which arose from the inner portion of the inferior fornix of the left eye. It was grayish-white and very hard. The conjunctiva was adherent. After excision, microscopic examination showed that the tumor was covered with many layers of epithelium. Hair follicles dipped down into the substance of the mass; sebaceous glands, blood-vessels, and sweat-glands were also found. The centre was taken up by fatty tissue. The tumor was undoubtedly congenital, but had not begun to grow until a later period.

ALLING.

XII.—CORNEA, SCLERA, AND ANTERIOR CHAMBER.

276. Holth, S. **Corneal epithelium and eye ointment.** *Norsk. magaz. f. lagevidensk.*, 1904, p. 315.

277. Spicer. **A case of hereditary nodular corneal opacities.** English Ophthalm. Society. *Arch. f. Augenheilk.*, xlix., 4, p. 358.

278. Bodenstein, R. **Amyloid concrements in the cornea.** *Beiträge z. Augenheilk.*, No. 60, p. 48.

279. Velhagen. **Primary, ribbon-shaped corneal opacities.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 428.

280. Fehr. **A case of lattice-like corneal opacity.** *Centralbl. f. pract. Augenheilk.*, xxviii., p. 173.

281. Foster, E. E. **On infiltration œdema (gelatinous degenerative pannus) underneath Bowman's membrane.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 330.

282. Erdmann, P. **Keratitis syphilitica.** *Zeitschr. f. Augenheilk.*, xi., 4, p. 297.

283. Stasinski. **A case of keratitis neuroparalytica caused by periostitis of the superior maxilla, with lethal exitus.** *Zeitschrift f. Augenheilk.*, xi., 5.

284. McNab, Angus. **Ulceration of the cornea due to infection with bacillus pyocyaneus.** *Ophthalmic Review*, March, 1904.

285. Kimpel. **Peroxide of hydrogen in ulcus serpens.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 579.

286. Mazet. **Keratectomy with conjunctival flap.** *Recueil d'ophtalm.*, xxvi., p. 269.

287. Holth, S. **The technique of tattooing the cornea.** *Norsk. magaz. f. lagevidensk.*, 1904, p. 557.

288. Yamaguchi, H. **Pathological anatomy of an eye operated on for corneal staphyloma.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 353.

289. Bock, Emil. **A lump of aniline dye in the cornea.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 105.

290. Elschnig. **Therapy of keratoconus.** *Wiener klin. Rundschau*, 1904, No. 20.

291. Gesang, B. **Membrana pupillaris persistens corneæ adhærens.** *Beiträge z. Augenheilk.*, No. 60, p. 42.

292. Norman-Hansen, C. **Healing of scleral wounds.** Second meeting of the (Danish) Ophthalm. Society, 1904. *Hospitalstid*, 1904, p. 395.

293. Lauber, H. **Scleral cysts.** *v. Graefe's Arch. f. Ophth.*, lviii., 2, p. 220.

294. Ewetzsky, F. O. **A fly larva in the anterior chamber.** *Westn. Ophth.*, 1904, No. 4.

Bodenstein (278) found amyloid in ribbon-shaped corneal opacity in an eye blind from choroiditis, and in a similar, atypical opacity of an otherwise normal eye in a healthy man of middle age. The histological material was won by curettage.

Velhagen (279) found primary ribbon-shaped corneal opacities in two old brothers. The more advanced case, in which the changes reached into the pupillary area, suffered and died of arterio-sclerosis, which, however, could not be found microscopically in the ocular vessels. Lime was found in Bowman's membrane. Degenerated elastic fibres were found in the iris angle and sclera: and pigment cells in Fontana's trabecular space; all signs of a beginning glaucoma which had not betrayed itself during life.

Fehr (280) reports a new case of lattice-formed corneal opacity; twenty-seven cases have been described in six families.

In a child's eye with old iridocyclitis and apparently slightly changed cornea, Foster (281) found between Bowman's membrane and a practically normal stroma a thick, diffuse infiltration of gelatinous substance, with numerous polynuclear cells and some fine fibrils. A few vessels were also found. F. compares this tissue to degenerative pannus.

Erdmann (282) observed in a man with syphilis a parenchymatous keratitis, in which two pinhead ulcerations developed. These healed in five days under treatment with iodide of potash. The corneal opacity was treated further with mercury. The second case was that of a child four months old, on whose cornea a large lentiform protrusion, about *7mm* in diameter, was seen. The child was marantic, as a result of hereditary syphilis, and was treated with calomel. The cornea healed with a small scar

in a month or so. Both cases were diagnosed as gumma of the cornea. E. believes that specific treatment might well be applied in keratomalacia and in phlyctenular corneal affections of an obstinate nature accompanying lues.

McNAB'S (284) patient was a man of forty, whose eye had become inflamed six days before. Vision was reduced to perception of the hand. There was no history of injury. There was marked œdema of the left eye, with circumcorneal injection, greenish conjunctival secretion, and deep corneal ulcer. The anterior chamber was full of pus. Xerosis bacilli and the bacillus pyocyaneus were found. A Saemish incision was made and the pus evacuated. This also contained pyocyaneus bacilli in large numbers. An anterior synechia resulted which required iridectomy. The ulcer healed under treatment with a solution of mercury cyanide, but vision was not improved.

DEVEREUX MARSHALL.

In a case of ulcus serpens, KIMPEL (285) observed an immediate effect on application of hydrogen peroxide three per cent. in the form of an area of minute whitish bubbles, in various depths of the corneal substance, with fine white radiations into the apparently normal tissue.

YAMAGUCHI (288) examined two eyes, one of which had been sutured and the other left open after abscission of staphyloma. Neither method excluded wound complications. Suturing may produce necrosis or suppurative changes in the lips of the wound and neighboring parts. In two cases necrotic processes in the uveal tract were also observed. A fatal meningitis was observed, which Y. does not think depended upon intraocular suppuration.

In BOCK'S (289) patient a small lump of aniline dye, the size of a poppy seed, lay upon the corneal margin for two days. The cornea was not stained and the conjunctiva only slightly so. The stain disappeared within a day.

ELSCHNIG (290) repeats his suggestion for the improvement of cauterization of the apex of the cornea in staphyloma. He burns the eccentric points of the cone deeply and draws a superficial, ribbon-shaped scar to the nearest point of the corneal margin. This becomes vascularized and changes to a thick scar, with a tendency to flatten the corneal protrusion.

The pupillary membrane, described by GESANG (291), was attached to the opaque and somewhat ectatic cornea, and

associated with anterior polar cataract. According to the definite statement of the parents, this corneal opacity was not present at birth, but was the result of a suppuration beginning four days after birth and lasting for six weeks. It was left to conjecture whether the pupillary membrane was connected with the cornea or not before the inflammation.

According to LAUBER (293) the development of scleral cysts depends upon two factors: first, a perforation of the external wall of the eye by injury or ulceration; secondly, an epithelial lining of the cyst, or incarceration of the iris. The cysts often grow through the sclera, which may easily be separated into lamellæ, while the simultaneously injured cornea preserves a somewhat more resistant structure.

EWETZKY'S (294) case was that of a boy of five and a half years who had signs of inflammation in one eye, lasting for a week, and relapsing for a short time, after a month's free interval. Four months later there was found episcleral injection, particularly below, with opacity of the corresponding segment of the cornea, posterior synechia, contracted pupil, which did not react to atropine, and in the lower portion of the anterior chamber a worm, which moved actively, although not directly visibly. After the operative removal of the worm, which was found to be the larva of a fly of undetermined species, recovery rapidly took place. E. considers it possible that the larva was that of hypoderma bovis. HIRSCHMANN.

Sections XIII.–XVIII. Reviewed by DR. O. BRECHT, Berlin.

XIII.—LENS.

295. Quackenbos, A. **Ligation of the canaliculi to prevent infection after extraction of cataract.** *Boston Med. and Surg. Jour.*, March 31, 1905.

296. Calhoun, A. W. **Relation of cataract to uncinariasis or hookworm disease.** *Ophth. Record*, April, 1904.

297. Pechin. **Safety of iridectomy in operation for senile cataract.** *Arch. d'opht.*, xxiv., No. 6, p. 351.

298. Freund. **Tetanus as cause of cataract formation.** *Wiener med. Wochenschr.*, 1904, No. 10.

299. Wernicke. **Is there a connection between cataract and goitre?** *Inaug. Diss.*, Freiburg, 1904.

300. Haas. **Discission of juvenile cataracts.** *Wochenschr. f. Hyg. und Therapie des Auges*, June, 1904, No. 17.

301. Wolthaus. **Operative treatment of congenital cataracts and their prognosis.** *Inaug. Diss.*, Freiburg, 1904.

302. Manolesco. **Operation for secondary cataract.** *Ann. d'ocul.*, cxxxi., p. 197.

QUACKENBOS (295) reports four cases of disease of the lachrymal sac in which temporary ligation of the canaliculi effectually prevented infection after cataract extraction. The application of the ligature is facilitated by the introduction of a sound; the ligature is removed in about nine days. ALLING.

CALHOUN (296) is firmly convinced that uncinariasis is an indirect cause of cataract. He has observed a number of cases in which the deep anæmia and lemon-yellow skin characteristic of hookworm disease was found in connection with opacities of the lens. ALLING.

PECHIN (297), formerly an advocate of simple extraction, pleads strongly for the retention of iridectomy, the disadvantages of which are slight in comparison to its almost invariable success. The latter is always a matter of chance in the flap extraction, which offers so many dangers. v. MITTELSTÄDT.

XIV.—IRIS.

303. Heath, C. W. **A case of tuberculous iritis, which was treated by injections of air into the anterior chamber (unsuccessfully).** *Ophth. Record*, May, 1904.

304. Barrett, James, and Orr, W. F. **A case of primary sarcoma of the ciliary body.** These ARCHIVES, xxxiii., 2, p. 144.

305. Streiff, J. J. **The crypt layer and the crypt-base layer of the iris, and the origination of serous cysts on the anterior surface of the iris.** *Arch. f. Augenheilk.*, l., p. 56.

306. Wicherkiewicz, B. (Krakau). **Can an iris, detached from its ciliary process, reunite spontaneously?** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 363.

307. Galezowski. **Congenital aniridia.** *Recueil d'opht.*, xxvi., p. 148.

308. De Schweinitz. **Bilateral coloboma of the iris, upward and outward.** *Ophth. Record*, 1904, No. 1, p. 22.

309. Manolesco. **Iridotomy.** *Ann. d'ocul.*, cxxxi., p. 378.

BARRETT and ORR (304) observed in a man of twenty-five a tumor of the iris of the right eye, extending to the ciliary region. After complete loss of sight the eye was enucleated. Microscopic examination showed a sarcoma which appeared to have originated in the ciliary process. ABELSDORFF.

STREIFF (305) discusses the literature of iris cysts and reports

an observation of his own. He designates the superficial layer of the iris as the crypt layer, the rest of this tissue as the crypt-base layer. Various possibilities must be considered in the development of iris cysts. Serous cysts of the anterior surface of the iris develop under the crypt layer as endothelial cysts by sacculation or after traumatic separation of a part of Fuchs's iris fissure (retention cysts), or, on the other hand, as epithelial cysts by congenital or traumatic transposition of epithelium into this fissure (congenital epithelial cysts and implantation cysts).

WICHERKIEWICZ (306) reports the case of a boy of twelve with a detachment of the iris 6 to 8*mm* wide, and dislocation of the lens due to the left eye having been struck with a stone two days before. After treatment for five days with cold applications and a mydriatic salve of atropine, scopolamin, and cocaine, the torn iris had healed so completely that no detachment could be made visible with eserine. A second, similar observation was made in a discission of after-cataract in an old man.

XV.—CHOROID.

310. Haas. **A case of indirect rupture of the choroid.** *Zeitschr. f. Augenheilk.*, xi., p. 496.

311. Dupuy-Dutemps. **Glaucomatous form of tuberculous choroiditis.** *Arch. d'opht.*, xxiv., No. 5, p. 309.

312. Parsons, H. **Diffuse sarcomata of the uveal tract.** ARCH. OF OPHTH., xxxiii., 2, p. 101.

313. Brown, Pusey. **A choroidal sarcoma which spread in a peculiar manner and contained cholesterin crystals.** IBID., xxxiii., 2, p. 125.

314. Kuhlo. **A new case of cavernous angioma of the choroid.** *Inaug. Diss.*, Greifswald, 1904.

315. Coppez. **A case of carcinomatous metastasis of both choroids.** *Arch. d'opht.*, xxiv., p. 79.

316. Greenwood. **Carcinoma of choroid metastasis from prostate.** *Boston Med. and Surg. Jour.*, Sept., 1903.

317. Goldzieher, W. (Budapest). **The prognosis of malignant tumors of the choroid.** *Centralbl. f. prakt. Augenheilk.*, xxviii., p. 135.

HAAS (310) observed after contusion of the globe with a springy stick a horizontal rupture of the choroid, with partial tearing of the retina from a point immediately below the disk into the macular region, with two small tears in the periphery, pigment patches, and numerous small hemorrhages in the retina.

A tuberculous ulcer, observed by DUPUY-DUTEMPS (311) in an otherwise healthy girl of six (in whom, however, a cold abscess of

the thigh developed later), originated in the macular region, then spread over the greater part of the choroid. Detachment supervened, followed by increased tension with scleral staphyloma, and finally a mild iritis. This clinical picture is typical, as is shown by the published cases of other observers. The age between six and twenty is diagnostically important, as is also the result of a general examination, as this form of tuberculosis is rarely really primary: the usually rapid growth of the tumor with increased tension—which according to the usual views is supposed to be absent in tuberculosis,—then the rapid extension to the sclera, and the final development of iritis.

The tuberculin reaction is not deciding, as it may be absent in undoubted cases. When in doubt, injection of aqueous into the eyes of guinea-pigs may be tried. V. MITTELSTÄDT.

XVI.—VITREOUS.

318. Polte (Halle). **Congenital tube formation in the vitreous body and malformation of the disk.** *Zeitschr. f. Augenheilk.*, xl., p. 492.

319. Jerussalimsky. **A case of complete persistent hyaloid artery.** *Westn. Ophth.*, 1904, No. 4.

POLTE (318) saw two young girls with formation of a hollow strand in the vitreous, starting at the disk and attached to the wall of the eye with a white base. He considers this a case of persistent hyaloid artery.

XVII.—GLAUCOMA.

320. Sala. **Some rare forms of glaucoma.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 316.

321. Brown, Pusey. **I. Osmotic disturbances as the cause of glaucoma. II. Experimental production and clearing of cataractous lenses.** Preliminary report. These ARCHIVES, vol. xxxiii., 2, p. 128.

322. Abadie, Ch. **Intermittent glaucoma and its treatment.** *Ann. d'ocul.*, cxxxi., p. 271.

323. Demaria, Enrique B. (Buenos Aires), **The pathogenesis of detachment of the choroid after iridectomy in glaucoma; and corpora amylacea in the excavated disk.** *Klin. Monatsbl. f. Augenheilk.*, xlii. 1, p. 339.

324. De Lapersonne, F. **Glaucoma and cataract.** *Arch. d'opht.*, xxiv., No. 6, p. 341.

325. Stieren, Ed. **Acquired hydrophthalmos.** *Amer. Med.*, April 4, 1904.

326. Fröhlich, Conrad. **Trephining of the sclera in painful absolute glaucoma.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 411.

SALA (320) reports acute glaucoma in a child of eight, with bilateral, apparently congenital, cataract, shrunken and with fluid contents. Six or seven hours after discission, acute glaucoma appeared. Paracentesis evacuated only a small amount of aqueous, but immediately cut short the glaucoma symptoms. The author appends two cases of slightly increased tension of the globe in patients of thirty-eight and fifty-three years, respectively. In one case, paracentesis evacuated a stringy fluid; in the other, hemorrhagic fluid without a tendency to coagulation. As cause of the increased tension in these cases and in other similar observations,—for instance, in iritis serosa or iritis with gelatinous exudation in the anterior chamber,—the author adduces mechanical interference with filtration at the iris angle in consequence of the presence of colloidal albuminous substances in the aqueous. The source of these colloid masses is indifferent. They may come from the lens in the case of the child, or be due to traumatic paralysis of the vessels of the iris or ciliary body. Glaucoma attacks after discission of secondary cataract are similarly explained by the mechanical irritation of the ciliary body, which stimulates the production of an albuminous aqueous. It is not necessary to assume any inflammation of the ciliary body or hypersecretion of aqueous under nervous influence. The accuracy of this view seems to be borne out by the radical effect of treatment, as paracentesis mechanically freed the filtration angle.

ABADIE (322) again calls attention to the great difficulty of diagnosing the first symptoms of glaucoma, in many cases which express themselves by attacks of trigeminal neuralgia, transitory diminution of vision, or the seeing of colored rings. These prodromata of glaucoma disappear only after early iridectomy, whereas the use of myotics alone may be insufficient to prevent blindness. A. admits, however, that he has not always been able to follow the course of the cases which were treated with myotics, as many such patients, after having been informed of the necessity of operation, did not reappear. BERGER.

The globe examined by DEMARIA (323) was taken from a female patient, aged fifty-four, with prodromal symptoms of glaucoma for five years and aggravation since four months coincident with influenza. Diagnosis: chronic inflammatory glaucoma, left; vision, movement of the hand toward temporal side; posterior sclerotomy and eserine. Iridectomy upward with loss of vitreous.

After two days, detachment of the choroid outward, and below, and inward. On account of continuous pain, enucleation. The anterior chamber was connected with the perichoroideal space by a tear, which contained blood and serous sanguineous fluid. This tear also communicated in places with Schlemm's canal, which also contained blood. The ciliary body was almost entirely separated from the sclera, and the free space between them filled with blood. At the right of the iris and on the outer surface of the ciliary body there were numbers of small fissures. Torn vortex veins were not found. There was a marked concave excavation filled with a mass of amyloid bodies, which showed iron reaction and were accordingly of hemorrhagic origin. These observations support Fuchs's theory of the detachment of the choroid.

DE LAPERSONNE (324) observed, six weeks after extraction with iridectomy, the development of a glaucoma, which he attributed to œdema of the vitreous produced by disturbance of the renal function. A curve of the urine and chloride excretion showed a minimum coinciding in time with the attacks of glaucoma. Before operation, traces of albumin were found. D. advises a careful examination of the renal secretion in suspected cases, particularly as regards chlorides, in order to avoid such accidents by appropriate diet, and suggests diminishing ocular tension by reduction of salt in the diet, if necessary.

v. MITTELSTÄDT.

STIEREN (325) reports the case of a girl of eleven, whose eye became inflamed after contusion, and within a year began to grow larger. After enucleation it measured 32*mm* in the antero-posterior diameter and 30*mm* across the equator. ALLING.

FRÖHLICH (326) performed trepanation of the sclera for painful absolute glaucoma in five cases, with success in four. A conjunctival flap is made along the lower border of the external and inferior rectus and detached at the corneal margin. It is then separated from the sclera and turned back toward the equator. Hippel's trepan, with a crown 5*mm* in diameter, is used to cut out a disk of the sclera behind the ciliary body and the conjunctival flap is reattached. It is important not to injure the deeper structures in cutting through the sclera. The latter may be punctured with the cataract knife, unless they are perforated spontaneously by the vitreous. Local anæsthesia is quite sufficient. Healing takes place in ten to fourteen days. Infection of

the vitreous was not observed. This operation has advantages over resection or enucleation, in place of which the author advises evacuation of the globe.

XVIII.—SYMPATHETIC OPHTHALMIA.

327. Raehlmann, E. (Weimar). **Ultramicroscopic examination of the cause of sympathetic ophthalmia.** *Deutsche med. Wochenschr.*, 1904, No, 13, p. 449.

328. Le Play and Corpechot. **Cytotoxic sera and sympathetic ophthalmia.** *Soc. de Biologie de Paris*, June 18, 1904.

329. Sourdille, G. **Morbid predisposition caused by the influence of an injured eye upon the other.** *Arch. d'ophtal.*, xxiv., No. 6, p. 359.

330. Grut. **Some remarks on cases of sympathetic ophthalmia and malignant iridocyclitis.** Third meeting of the Danish Ophthalm. Society, 1904. *Hospitalstid*, 1904, p. 661.

331. Jensen, Edm. **On sympathetic neurosis.** Third meeting of the Danish Ophthalm. Society. *Hospitalstid*, 1904, p. 683.

RAEHLMANN (327) examined the vitreous of a globe enucleated for sympathetic ophthalmia with a magnification of 2400 diameters, and found innumerable bacteria in rapid swarming motion. The prevalent form was that of a slender bacillus or double bacillus. Besides these, light yellow disks or globules were found, not larger than 0.1 μ. It is possible that these disk-like bodies are incubation forms of the bacteria. In the resected nerve no microbes could be found. Raehlmann considers sympathetic ophthalmia as metastatic infection of the second eye by micro-organisms.

LE PLAY and CORPECHOT (328) injected pure cultures of bacillus pyocyaneus into the anterior chamber of the left eye of a rabbit and wounded the right eye under aseptic precautions. In a number of the cases, ophthalmo-toxic serum, produced by maceration of the eyes of rabbits and guinea-pigs, was injected into the anterior chamber of the left eye, and subcutaneously into the abdominal region; and in another series injections of 7 % salt solutions were made in the same places. In the first series, general infection and metastasis to the right eye were much more frequent than in the second. The authors believe that sympathetic ophthalmia may be induced by cytotoxic serum.

BERGER.

SOURDILLE (329) reports several cases, in which, after slight injuries of one eye, keratitis or iritis appeared in the other previously quite normal eye, which were characterized by an ex-

ceedingly protracted course, and were rapidly healed as soon as the first eye was treated (in two cases by subconjunctival injections of mercury). A number of such observations exclude coincidence. In such cases there is a disturbance of nutrition, starting from the originally affected eye, which favors the development of common diseases. A knowledge of these observations may be of importance in the judgment of accident cases.

Sections XIX.–XXII. Reviewed by DR. H. MEYER, Brandenburg.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

332. Harms, C. **Anatomical observations on senile macular affections.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 448.

333. Kroner, C. **Exhaustion of the visual field.** *Inaug. Dissert.*, Berlin, 1904.

334. Holmström, J. **Acute central amblyopia.**

335. Asmus, E. **Light bandages in retinal detachment.** *München. med. Wochenschr.*, 1904, p. 703.

336. Gonin, J. **The rôle of the vitreous in the various forms of retinal detachment.** *Report of Tenth Internat. Congress of Ophthal.*, Lucerne, 1904,

337. Gonin, J. **Pathogenesis of spontaneous detachment of the retina.** *Ann. d'ocul.*, cxxxii., p. 30.

338. Ammann, E. **Retinal detachment and accidents.** *Zeitschr. f. Augenheilk.*, xi., 5, p. 406.

339. Stevenson and Stockdale. **Glioma retinæ.** *Liverpool Med. and Chir. Jour.*, Jan., 1904.

340. Hirschberg, J. **On glioma of the retina.** *Centralbl. f. Augenheilk.*, xxviii., p. 97.

341. Gendron. **Diagnostic difficulties in glioma of the retina.** *L'opht. provinciale*, i., p. 12.

342. Wilder, Wm. H. **A case of methyl-alcohol amblyopia.** *Ophth. Record*, May, 1904.

HARMS (332) describes the first anatomical examination of senile disease of the macula. The globe was removed on account of carcinoma of the orbit. The patient's age was eighty-seven. All the layers of the retina were found thin, but the macular changes were limited to the neuro-epithelial layer and were of a degenerative nature. Disturbances of nutrition or possible pathological processes in the pigment epithelium and in the choroid must be taken into consideration in its etiology. Endothelial changes in the vessels and thickening of the walls,

arterio-sclerotic changes, are partly to blame. The author considers an increased vulnerability of the retina in the macular region the underlying cause of this affection.

KRONER (333) examined six patients of the Moabit Hospital, before and after work, with an ergostat, to determine the exhaustibility of the visual field. He finds:

1. In cases where the visual field cannot be exhausted by the usual methods, physical exertion produced very slight effect of contraction and further exhaustion.

2. In persons with exhaustible visual field, active exercise was followed by concentric contraction and more rapid exhaustion.

3. In certain cases, contraction without further exhaustion was found.

4. After a quarter to half an hour, recuperation took place, which progressed at first more rapidly and then slowly.

An experiment with mental labor in the case of an epileptic, aged thirteen, showed comparatively slight contraction and exhaustion as compared to physical work.

HOLMSTRÖM (334) reports several cases of acute central amblyopia in otherwise perfectly healthy adults. The affection developed suddenly and without prodromata, was generally unilateral, and reached a maximum within a day or two and gradually receded. Central color scotoma was found, which was not as regular in form as that of toxic amblyopia. Headaches and pains in the eyes were occasionally observed. The ophthalmoscopic finding was negative, and blanching of the temporal half of the disk was rarely seen. The etiology was doubtful. Catching cold was given as a cause in one or two instances. The prognosis is absolutely good, visual acuity returning in a few weeks or months. DALÉN.

ASMUS (335) advises the treatment of detachment by rest in the horizontal position, sweating, and light bandages of the eye before any operative interference. In this way improvement and cure were attained in three cases of various degrees of myopia. In all three, choroidal disease was found as an etiological factor.

In answering the question whether a retinal detachment after blunt injury should be considered traumatic, only when it immediately follows the injury, AMMANN (338) reports two cases in which he recognizes the connection between the detachment and contusion which had preceded by several weeks.

HIRSCHBERG (340) reports a case of glioma in a little girl of

seven months which had been observed by the parents since the ninth week. The operation offers a favorable prognosis only when a new growth is limited to the retina and not more than ten weeks have elapsed since the appearance of a yellow reflex in the depth. Enucleation was carried out and the globe removed with 10*mm* of the nerve—that is to say, about one half of the orbital portion.

XX.—OPTIC NERVE.

343. Van Geuns. **A case of an arterial loop penetrating into the vitreous body.** *Zeitschr. f. Augenheilk.*, xi., 4, p. 316.

344. Bechterew, W. **Supraorbital, non-progressive atrophy.** From a report in the *Westn. Ophth.*, 1904, No. 4.

345. Gagarin, Dr. **A case of avulsion of both optic nerves.** *Westn. Ophth.*, 1904, No. 4.

346. Coats, G. **Thrombosis of the central vein of the retina.** *Royal London Ophth. Hospital Reports*, vol. xvi., part 1.

347. Cramer, E. **On juvenile forms of non-toxic chronic retrobulbar neuritis.** *Zeitschr. f. Augenheilk.*, xi., 6, p. 523.

BECHTEREW (344) reports a case in which intense pains in the left brow set in during treatment with inunctions for cerebral lues. The left eye became red, the left half of the nose cyanotic, a herpetic eruption appeared over the left brow, going on to ulceration. Skin, connective tissue, and bone became atrophic in these regions. In three similar cases the process developed in the region of the supraorbital nerve and remained stationary at certain stages. The disease depends upon trophic involvement of the secretory and motor nerves. HIRSCHBERG.

GAGARIN'S (345) patient was kicked by a horse in the face and immediately lost consciousness. On coming to, he was absolutely blind. A comminuted fracture of both upper maxillæ, palate bones, and septum was found. Fourteen days after the injury, and later, Gagarin found œdema of the lids and conjunctiva, extra- and intra-ocular extravasates, and ophthalmoplegia externa, anæsthesia of cornea and conjunctiva, pupils widely dilated and paralyzed. Ophthalmoscopic examination showed black spots in place of the disks, without vessels, and giving the appearance of holes in the retina. Two or three small vessels ran to the edge of the hole, and there terminated abruptly, as if cut off. These were surrounded by a light yellow zone. Gagarin explained this picture by traumatic separation of the globes from the optic nerves.

COATS (346) reports pathological findings in four cases of thrombosis of the central retinal vein. In the first case, no true thrombus was found, but the walls of the retinal and central vein were enormously thickened. In the second case, an organized thrombus was found in the retinal vein and a canalized older thrombus in the central vein. In the two other cases, the thrombus had entirely obliterated the central vein. In the fourth case, the venous circulation was restored by enlarged collaterals from the optic nerve. Endarteritic and phlebitic changes, proliferation, hyaline degeneration of the walls, and secondary thrombosis were found in all the retinal vessels. SCHULZ.

Juvenile retrobulbar neuritis (367) is characterized by sudden diminution of vision without fundus changes. In one case, CRAMER determined the presence of a central scotoma, after vision had been improved by treatment with aspirin. In his three cases, there appeared within a few months typical pallor of the temporal half of the disk. The cases all ended favorably. Cramer advises sweating and the administration of iodide of potash, although many of these cases represent an early stage of multiple sclerosis.

XXI.—INJURIES, FOREIGN BODIES, AND PARASITES.

348. Lange, O. **A case of traumatic bitemporal hemianopsia with hemianopic reaction of the pupil.** *Klin. Monatsbl. f. Augenheilk.*, xlii., 1, p. 419.

349. Lundsgaard, K. K. K. **Ocular lesions through electric short-circuit.** *Hospitalstid*, 1904, p. 401.

350. Norrie, Gordon. **Injury of the eye by a "Chinese pistol" (firecracker?).** *Hospitalstid*, 1904, p. 300.

351. Kraus, J. **Double perforation of the globe by an iron splinter, making the ciliary processes visible.** *Zeitschr. f. Augenheilk.*, xi., 6, p. 481.

352. Bock. **Lump of aniline dye in the cornea.** *Centralbl. f. Augenheilk.*, xxviii., p. 105.

353. Natanson, A. **Injuries of the eye by objects containing aniline.** *Zeitschr. f. Augenheilk.*, xi., 4, p. 312.

354. Denig, R. **Injuries of the eye by ammonia.** *Zeitschr. f. Augenheilk.*, xi., 4, p. 308.

355. Hirschberg, J. **The passing of the cysticercus.** *Berl. klin. Wochenschr.*, 1904, No. 25.

356. Stieren, Edw. **Acquired hydrophthalmos.** *Amer. Med.*, April 4, 1904.

LANGE (348) saw a patient who had fallen on his head three months before. There was paresis of accommodation, bilateral

temporal hemianopsia, and hemianopic pupillary reaction, loss of the sense of smell on the right side, and transitory diabetes. A rupture of the chiasm in a sagittal direction was diagnosed. As there was not only direct but consensual pupillary reaction, this case seems to speak for a central connection between both sphincter nuclei. The fact that the nasal field was normal for white and for colors shows that the nasal half of the retina is supplied only by the crossed fibres and the temporal side only by the uncrossed fibres.

LUNDSGAARD (349) reports three cases of eye injuries by short-circuit, 550 volts. The symptoms were dazzling, pain, photophobia, and caloric eczema, occasional burns of the first degree, hyperæmia of the conjunctiva, at times associated with mucopurulent secretion, corneal opacity, hyperæmia of the iris, clouding of the retina, with blurring of the disk, transitory or permanent disturbances of vision up to complete blindness, contraction of the visual field, hemeralopia, neuralgia, and so forth. In one case, five months after the injury, white, yellow, and black spots were found along the horizontal retinal vessels on both sides of the disk, together with progressive detachment.

DALÉN.

KRAUS (351) adds a case to the twenty-four already published of double perforation of the globe. The foreign body was a large iron splinter covered with brass, on which the entire globe was spitted. The hemorrhagic effusion in the vitreous became organized, gradually dislocated the lens, and produced an ectropion of the iris, so that thirty-four ciliary processes became visible. Cicatricial connective tissue around the posterior segment of the globe produced divergent squint. In all cases of penetrating wounds, examination with the sideroscope and radiography are advised.

NATANSON (353) reports two cases of inflammation of the eye by aniline colors in which, without affecting the vision, marked discoloration of the conjunctiva was caused,—in one case by a broken point of an aniline pencil, and in the other case, by a small piece of dried hectographic ink.

DENIG'S (354) three cases of injury with liquid ammonia show that in these cases we must be prepared for surprises, as even slight corrosion of the cornea of only pin-head size may be protracted for weeks. Immediate and free irrigation of the eyes is advised.

HIRSCHBERG (355) calls attention to the decrease of cysticercus of the human eye, which was quite frequent. Since ten years it has entirely disappeared. This is explained by the careful meat inspection. At the beginning of the nineteenth century, Rudolfi found cysticercus in 2 % of all autopsies. In 1875, Virchow found $1\frac{1}{10}$ %. Hirschberg found the last remnant of a dead cysticercus in 1903.

STIEREN (356) relates a case of a girl, aged eleven, whose eye became inflamed after a contusion, and a year later began to enlarge. When enucleated it measured 32*mm* in antero-posterior diameter and 30*mm* equatorially. ALLING.

XXII.—OCULAR DISTURBANCES IN GENERAL DISEASES.

357. Hertz, V. **Intracranial, bilateral paralysis of cerebral nerves with chronic course and choked disk; probably chronic basilar meningitis due to hereditary syphilis.** Fifth meeting of the Danish Ophthalm. Society, 1904. *Hospitalstid*, 1904, p. 868.

358. Bocci. **Bilateral hysterical amaurosis.** *La clinica ocul.*, April, 1904.

359. Galezowski. **Fundus oculi in affections of the nervous system.** *Thèse de Paris*, 1904.

360. Feilchenfeld, W. **Affections of the pons.** *Zeitschr. f. Augenheilk.*, xl., 4, p. 314.

361. Nicolai. **Optic-nerve atrophy in tabes dorsalis.** *Charité-Annalen*, 28th year.

362. Nettleship, E. **Observations on the prognostic and diagnostic value of retinitis in diabetes.** *Royal London Ophthalmic Hospital*, vol. xvi., part 1.

363. Nettleship, E. **On renal retinitis in young subjects and on the relative frequency of juvenile interstitial nephritis in the two sexes.** *Royal London Ophthalmic Hospital Reports*, vol. xvi., part 1.

364. Ritzke, A. **The affection of the eye in sausage poisoning (botulismus).** *Inaug. Diss.*, Leipsic, 1904.

365. Blagoweschtschensky, D. A. **Blood-letting in hemeralopia.** *Westn. Ophth.*, 1904, No. 4.

366. Schmiegelow, E. **The relation between eye-disease and nasal affections.** First meeting of the Danish Ophthalm. Society, 1904. *Hospitalstid*, 1904, p. 50.

BOCCI (358) reports the case of a girl of twelve who was attacked with bilateral blindness during menstruation. Pupillary reflexes were retained, but the pharyngeal reflex had disappeared, and hyperæsthetic zones were found. The case was cured by suggestion. CIRINCIONE.

FEILCHENFELD (360) reports a case of right-sided facial paralysis with abducens paresis. After this had disappeared, left abducens, facial, and hypoglossic paresis developed suddenly with marked vertigo and disturbances in the left acusticus. The next day, paresis of the right arm and leg, vomiting, and lethal exitus. Feilchenfeld diagnosed hemorrhage in the left pons at a level of the nucleus of the abducens, where the root of the facia, dorsal nucleus of the acusticus, and the vestibular nuclei are situated.

NICOLAI (361) saw eighteen cases of tabic optic-nerve atrophy in the Charité. Reflex pupillary paralysis was found eleven times, with frequent difference in the pupils, and spinal myosis. Transitory paralyses of the external muscles are characteristic. Careful examination of the visual field is important. The red and green fields are lost first. Contraction of the visual field begins regularly on the temporal side. Central color scotoma is never seen. The ophthalmoscopic picture is at first normal; pallor of the temporal side of the disk comes on later. The syphilitic infection seems to be only a predisposing cause, so that a specific treatment, after the diagnosis is established, should be used with care, whereas electricity, baths, strychnine, and nutritious diet are to be advised.

NETTLESHIP (362) considers the prognosis as to general health better in diabetic retinitis than in albuminuric retinitis, although the promise of an improvement in vision is to be given with care.

SCHULZ.

NETTLESHIP (363) collected 80 cases of interstitial nephritis in patients under twenty-one. In 31 of these cases, retinitis or multiple retinal hemorrhage was seen; in 10 the fundus was normal. In 149 cases of parenchymatous nephritis in patients under twenty-one, 7 cases of retinitis were found; in 43 cases the eyes were normal. In 40 cases of retinitis of nephritic origin, 18 were in patients under thirteen, 22 in patients up to twenty-one years. In contradistinction to interstitial nephritis in adults, the male sex is most often affected in children. Of the 80 cases examined, 51 were female, 28 male. SCHULZ.

RITZKE (364) has gathered sixty-two cases of botulism, and adds two original observations from the practice of Professor Tronourd. Accommodation paralysis is the most frequent and characteristic symptom. The pupils are rarely affected. Ocular motor palsy is frequent. The prognosis is good in regard to

sight. The anaërobic bacillus of botulismus is the cause of this disease, which brings about a toxic degeneration of Nissl's bodies. The accommodatory paresis is a nuclear affection and depends upon the degeneration of the ganglion cells.

BLAGOWESCHTSCHENSKY'S (365) patient complained of hemeralopia and headaches, from which he had frequently suffered until relieved by epistaxis. Wet cups were applied to the neck. The next day the patient was entirely well. The result of this treatment, which has been repeatedly used by Blagoweschtschensky with equal success in robust and decrepit individuals, speaks against the usual theories of the causation of hemeralopia by insufficient diet, dazzling, or malaria. HIRSCHMANN.

Of sixty-three patients treated by SCHMIEGELOW (366) for accessory sinus affections, seventeen had complicated ocular affections (epiphora, blepharo-conjunctivitis, ciliary neuralgia, orbital pain, convergent squint, dislocation of the globe—caused by orbital phlegmon, paralysis of the orbital muscles, endothelioma, and mucocele,—amaurosis, scintillating scotoma, accommodative asthenopia). Schmiegelow considers this question of the dependence of the various ocular affections on nasal diseases, the various ways, in which the transmission takes place, and the great diagnostic difficulties which sometimes exist. Careful rhinological examination is indicated in many affections of the eye, particularly in amblyopia, affections of the optic nerve and choroid, paresis of accommodation, asthenopia, disturbances of the ocular muscles, and pain in the neighborhood of the eye.

DALÉN.

CORRECTIONS OF ERRORS OF PRIORITIES.

I.

To the Editor of the ARCHIVES OF OPHTHALMOLOGY:

In my article on "The Use of Paraffin Spheres in Frost's Operation," etc., ARCHIVES OF OPHTHALMOLOGY, vol. xxxiv., No. 2, 1905, the statement on page 125, that Ramsay injected the paraffin in the scleral cavity, is an error. Dr. Ramsay advises me that the eyes were enucleated, and in all cases the paraffin was placed in Tenon's capsule. Will you kindly print this correction?

CHARLES NELSON SPRATT.

II.

To the Editor of the ARCHIVES OF OPHTHALMOLOGY:

In the March issue of the ARCHIVES, Dr. Spratt reports twenty-three cases in which paraffin balls were placed in Tenon's capsule after enucleation. He recognizes my priority in the use of paraffin balls after evisceration, but overlooks the fact that I also employed them after enucleation.

The operation of inserting a ball of paraffin in Tenon's capsule after enucleation was first described by me at the New York Academy of Medicine, April 20, 1903, and published in the ARCHIVES OF OPHTHALMOLOGY, vol. xxxii., 1903, p. 389.

Very sincerely yours,

EDWARD L. OATMAN,
Brooklyn, N. Y.

Fig. 1.

Fig. 2.

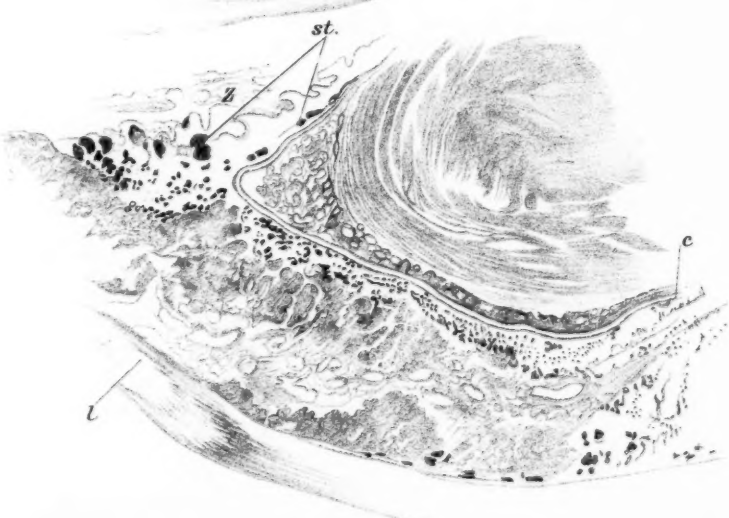

Fig. 3.

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Fig. 4.

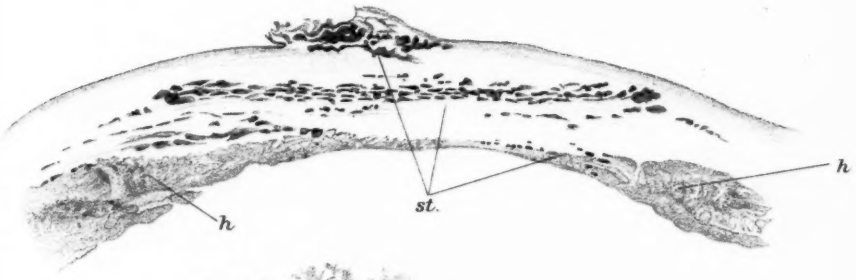

Fig. 5.

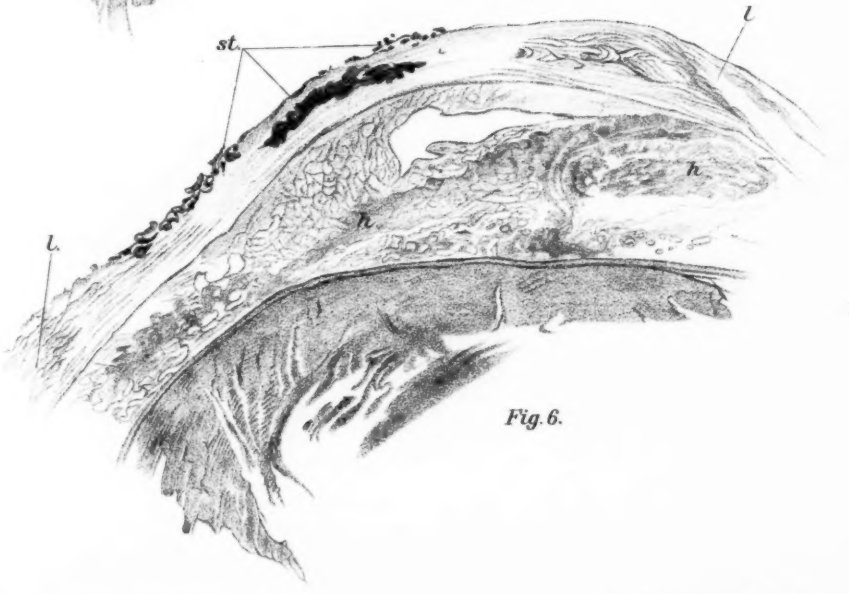

Fig. 6.

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Dr. P. Fridenberg del.

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